-AMR 25% Super Decathlon-

Building manual

-96'' wing span---64 ½'' fuselage---1 488 Sq. In.---35/50cc engine-

www.amr-rc.com

October 24, 2012

-Warranty-

Aircraft Modelers Research Incorporated guarantees this kit to be free from defect in both material and workmanship at the date of purchase. This warranty does not cover any component parts damaged by use or modification. **In no case shall Aircraft Modelers Research's liability exceed the original cost of the purchased kit.** Further, Aircraft Modelers Research reserves the right to change or modify this warranty without notice.

Aircraft Modelers Research has no control over the final assembly or materials used for final assembly, no liability shall be assumed nor accepted for any damage resulting from use by the user of the user-assembled product. By the act of using the user-assembled product, the user accepts all resulting liability

Buyers must be prepared to accept all reasonable liability associated with the assembling and use of this product. All returns of kits, parts or components thereof must necessarily be approved by the manufacturer of the product before mailing.

Introduction

Thank you for purchasing AMR product. AMR (Aircraft Modelers Research) prides itself on bringing you the finest aircraft model kits due to our team efforts and our state of-the-art equipment that affords exceptional quality. Using CNC driven production equipment, each of our kits is individually laser-cut according to plans which includes custom fittings and hardware sets specific to your model. We, as the kit manufacturer, provide you with a top quality kit and instructions. However, the quality and flying ability of your finished model depends on how you build it; therefore, we cannot in any way guarantee the performance of your completed model and no representations are expressed or implied as to the performance or safety of your completed model.

Before starting to build, use the Part List on the next pages to take an inventory of your kit to make sure it is complete and inspect the parts to make sure they are of acceptable quality. Remember to take your time and follow the instructions to end up with a well-built model that is straight and true. If any parts are missing, not of acceptable quality or if you need assistance with assembly, contact AMR Customer Service. When reporting defective or missing parts, use the part number exactly as they are written.

Enjoy !

The AMR Team

Customer Service
Aircraft Modelers Research
2550 Chemin du Lac
Longueuil, Quebec, J4N 1G7
Canada
www.amr-rc.com
Phone: 450-670-2444
Fax: 450-677-5327
customerservice@amr-rc.com

Before you begin, important notes from A.M.R

1-) This model airplane is not a toy. It must be built with outmost care. It is imperative that you follow each steps of the building manual. If you need assistance of any kind, please contact us directly.

2-) Adhesives:

a-) For general assembly, wood glue works best.

b-) C.A adhesives can be used. However, their high-toxic level makes them uncomfortable for some builders.

c-) IMPORTANT: For hi-strength sections, you must use **"Structural Epoxy"** types, not the 5 or 30-minute types available in most hobby shops. In this manual, you will notice that some assemblies do mention "use epoxy" and you must do so. Structural epoxies penetrate deep into the wood fibbers, creating a very strong bond. We recommend these brands: G2 Epoxy kit, T88 Epoxy or West Systems. They are available from any Aircraft or Marine specialty shops in convenient sizes. Carefully follow their mixing ratios.

3-) We recommend that all control horns be 8-32 types (no less) and that all screws/nuts be secured with thread locker.

4-) A straight airframe is the only way to go. Make sure that you have a straight building surface before you begin building.

5-) Sanding bars: Using ½" balsa planking (not included) make 3 of them, 3" wide x 18" long with some 100, 180 and 280 grit sand paper.

6-) If something looks wrong, it probably is. Make sure that you follow the building sequences with the appropriate part number.

7-) Take your time and verify the alignment before final gluing. This extra caution will eliminate possible frustrations.

Balance your plane carefully. Use servos that provides sufficient torque and high power batteries to fly this aircraft.

Recommended engines: Any good 30 to 50CC engines are suitable for this plane. It is strongly recommended to stay within this range. **Failure to follow this recommendation may damage the airplane since it is not design for larger engines.**

The plane fly very well when properly balanced and trimmed. First flight should be done by experienced pilot only even if it is easy to fly once trimmed.

A.M.R 25% Decathlon hardware list

Description	Quantity
Tailwheel bracket	1
Servo Lead tubes/48'' long	3
Robart 3/16'' Hinge points	24
Robart 1/8 '' Hinge points	2
Wheels	2
Main landing gear/pair	1
#4 x 3/4'' Wood screws	12
#4 x 1/2'' Wood screws	24
7/8'' x 24'' Alu. Wing tube + socket	1
.058'' Flying wire	4 foot
Sullivan steel tabs	8
.032'' x 4'' x 10'' Alu. sheet	1
Glass wing tips	2
Glass wheel pants	2
Glass cowling	2 pieces
Glass dashboard	1
Window set	1
10-32 x 2'' Cap screws/axels	2
4-40 Eye hooks	6
Sullivan Clevises	4
#4 Washers	16
4-40 x 5/8'' Cap screws	16

Description	Quantity
4-40 x 1/2'' Cap screws	16
4-40 x 3/4'' Cap screws	6
4-40 x 1 1/4'' Cap screws	6
4-40 x 1 1/2'' Cap screws	2
6-32 x 5/8'' Cap screws	2
8-32 x 1 1/4'' Cap screws	6
1/4-20 x 1'' Cap screws	2
4-40 Nylon nuts	52
6-32 Nylon nuts	2
4-40 Blind nuts	8
6-32 Blind nuts	2
8-32 Blind nuts	6
1/4-20 Blind nuts	2
Sullivan Control Horns	4
Sullivan Control Horns/rudder	1
Strut Bracket #SD50BR5	2
Flying wire bracket #SD50BR1	1
Strut support Bracket # SD50BR3	10
Fuse strut bracket #SD50BR2	2
Inter-Strut Wing bracket	4
Dubro Steel Straps	4
3/16'' x 36'' Brass tube	1

A.M.R 25% Decathlon wood list

Description	**Quantity**
1/8'' x 1/2'' x 48'' Balsa sticks	10
1/8'' x 1/2'' x 48'' Balsa sticks	4
1/8'' x 4'' x 48'' Balsa sheets	11
1/4'' x 1/4'' x 36'' Balsa sticks	8
1/4'' x 3/8'' x 48'' Balsa sticks	1
3/8'' x 3/8'' x 36'' Balsa sticks	8
3/8'' x 1/2'' x 24'' Balsa sticks	1
1/2'' x 1'' x 48'' Balsa sticks	2
1/4'' x 1/2'' x 48'' Hardwood	8
3/8'' x 3/8'' x 48'' Hardwood	1
1/2'' x 48'' Triangular/Hardwood	1
3/4''x 3/4'' x 6'' Hardwood	1
Small struts/Hardwood	2
Large struts/Hardwood	2
3/8'' x 6'' Dowel	1
5/8'' x 6'' Dowel	1

NOTICE TO BUILDER:

Working Surface:

A flat surface at least 24 X 72 inches is require to build this model. It is important the surface is flat to guaranty straight building.

Wood :

After removing parts from the laser cut plywood and balsa, it is highly recommended to keep some scrap pieces for later use during the build.

Tools:

Long sanding block, X-Acto cutter or razor blades, modeling saw, masking tape, ruler, square, small plane (to rough leading edge or other parts), various power tools as available.

ALWAYS DRY FIT PARTS PRIOR APPLYING ANY GLUE

FUSELAGE ASSEMBLY

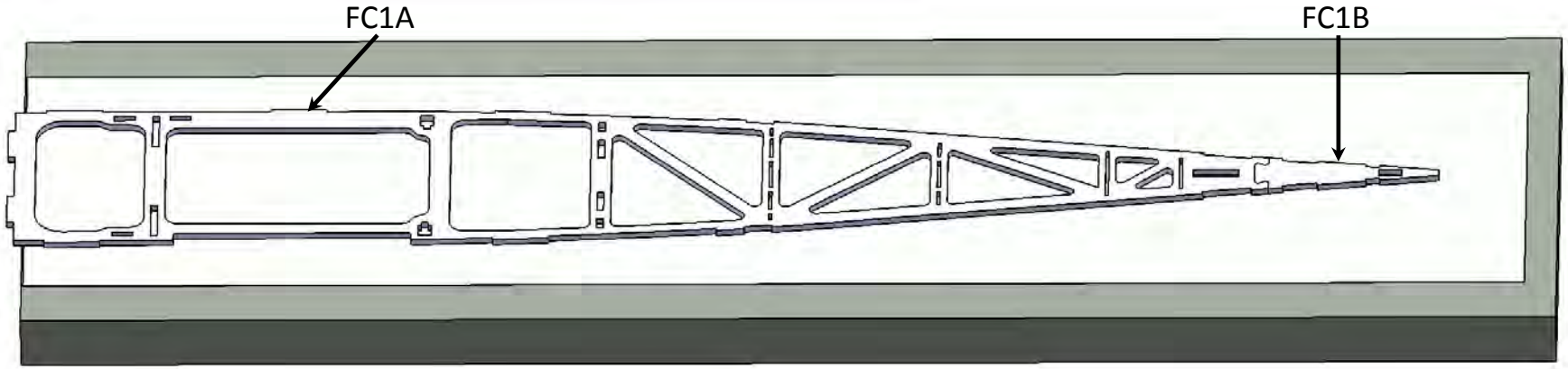
Follow directions carefully

Always dry fit first

Assemble all components on a flat building board

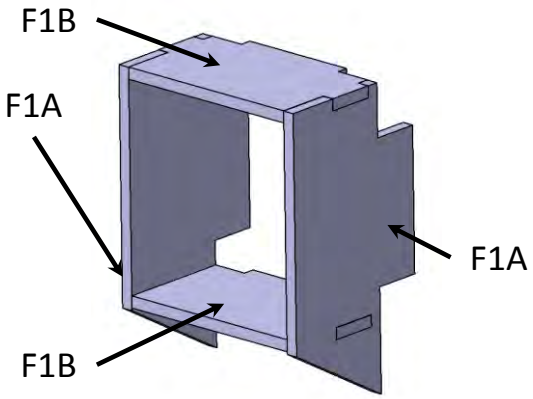
STEP1

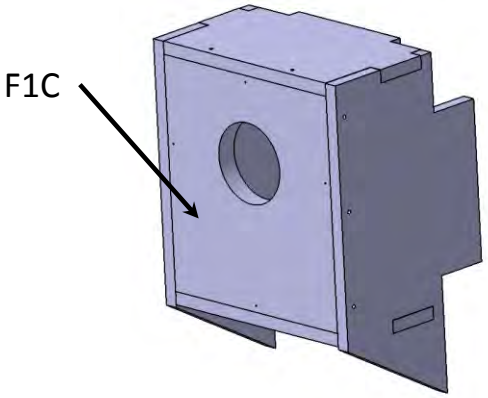
1-install on a flat building surface a sheet of waxed paper
2-Dry fit FC1A and FC1B to make sure it fit properly.
Notice door location should be on the left side since the fuselage is build from the bottom
2-Once fit is found correct, apply glue to join both parts as shown. Assembly will be done over FC1 assembly.

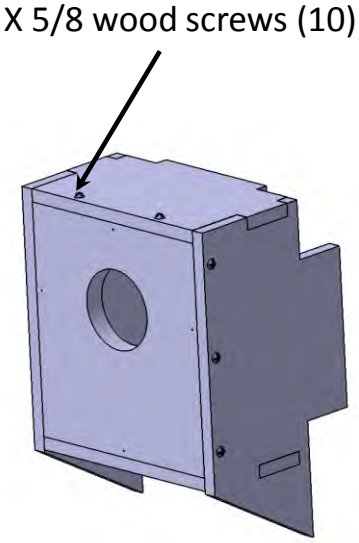


STEP2

1-Dry fit assembly of (2) F1A and (2) F1B and 1 F1C as shown.
2-Once fit is found correct, apply glue to join both parts.
3-Use #2 X 5/8 wood screws as shown to secure F1C

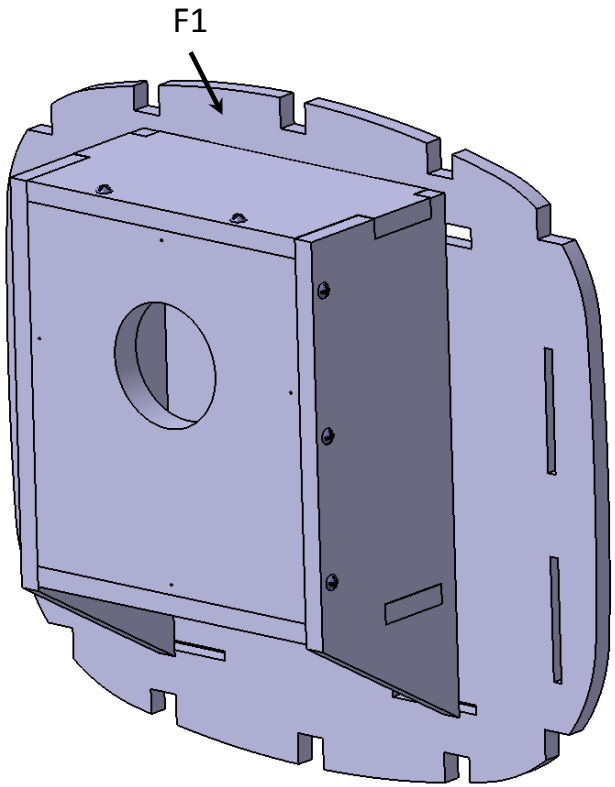


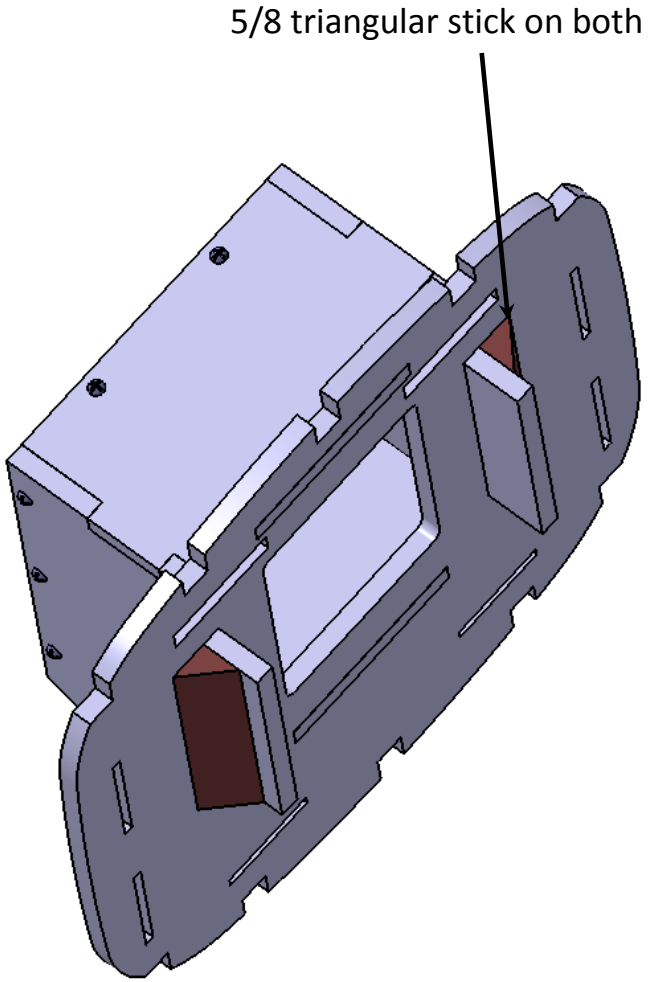




STEP3

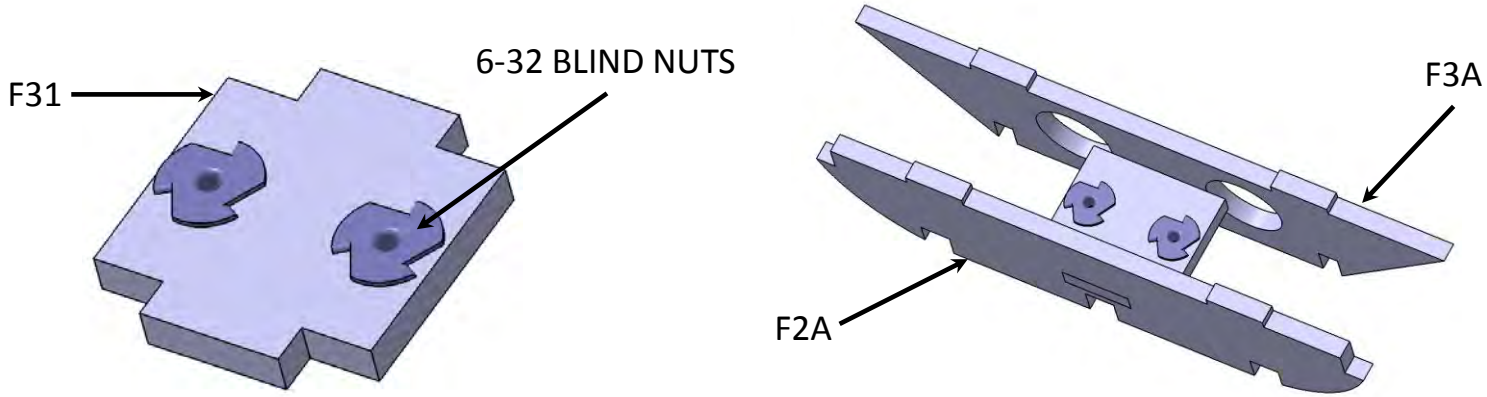
1-Dry fit STEP2 assembly on F1 to make sure it fit properly.
2-Once fit is found correct, apply glue to join both parts as shown.
3-Cut (2) 1/2 triangular hardwood sticks 3 inches long and glue behind F1 as shown





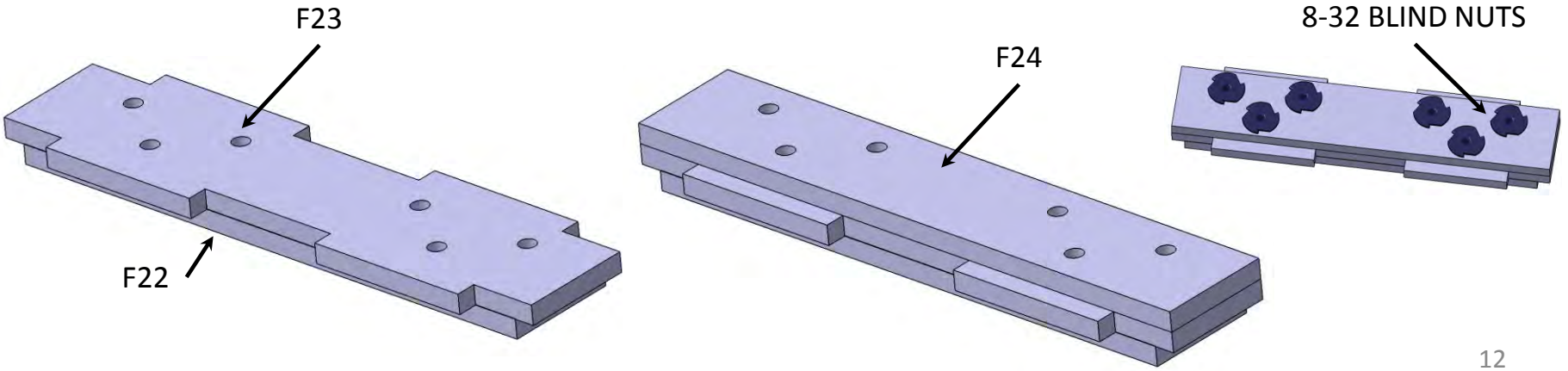
STEP4

1-Install (2) 6-32 blind nuts and apply glue around nut flanges
2-Dry fit F31 to F2A and F3A. Once fit is found correct, apply glue to join both parts as shown.



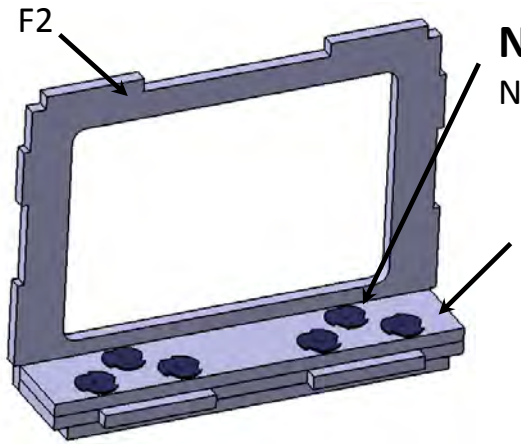
STEP5

1-Glue F23 over F22 and make sure to align holes properly. Notice that F23 is wider than F22.
2-Glue F24 over F23 and make sure to align holes properly. Notice that F24 is the same width than F23.
3-Install (6) 8-32 blind nuts as shown on F24. Apply glue around blind nut flanges

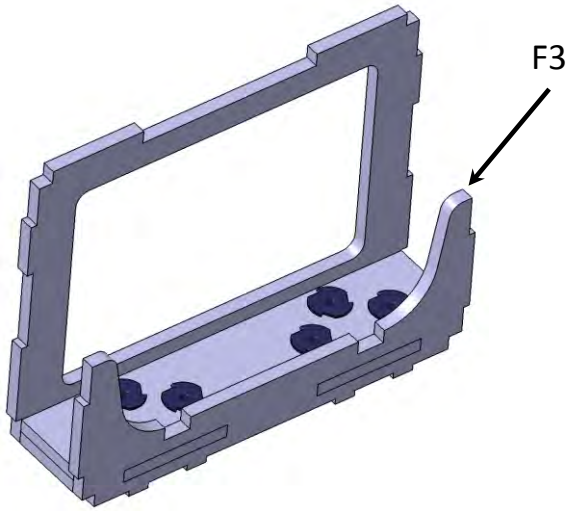


STEP6

1-Install (2) 6-32 blind nuts and apply glue around nut flanges
2-Dry fit F31 to F2A and F3A. Once fit is found correct, apply glue to join both parts as shown.

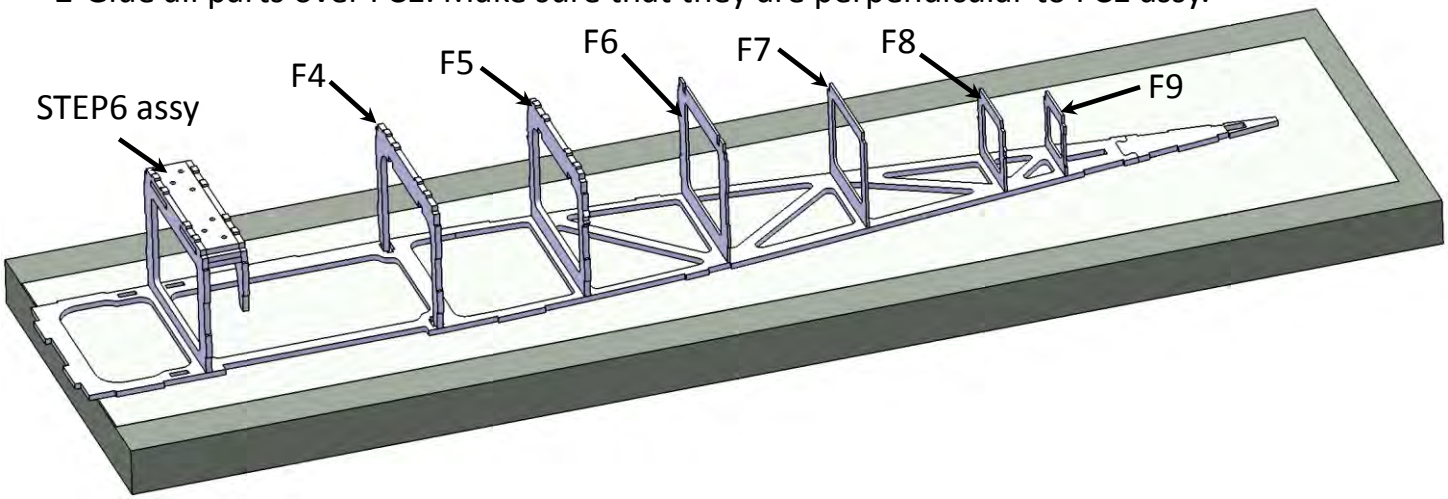


NOTICE: 2 BLIND NUTS ROW NEAR F2



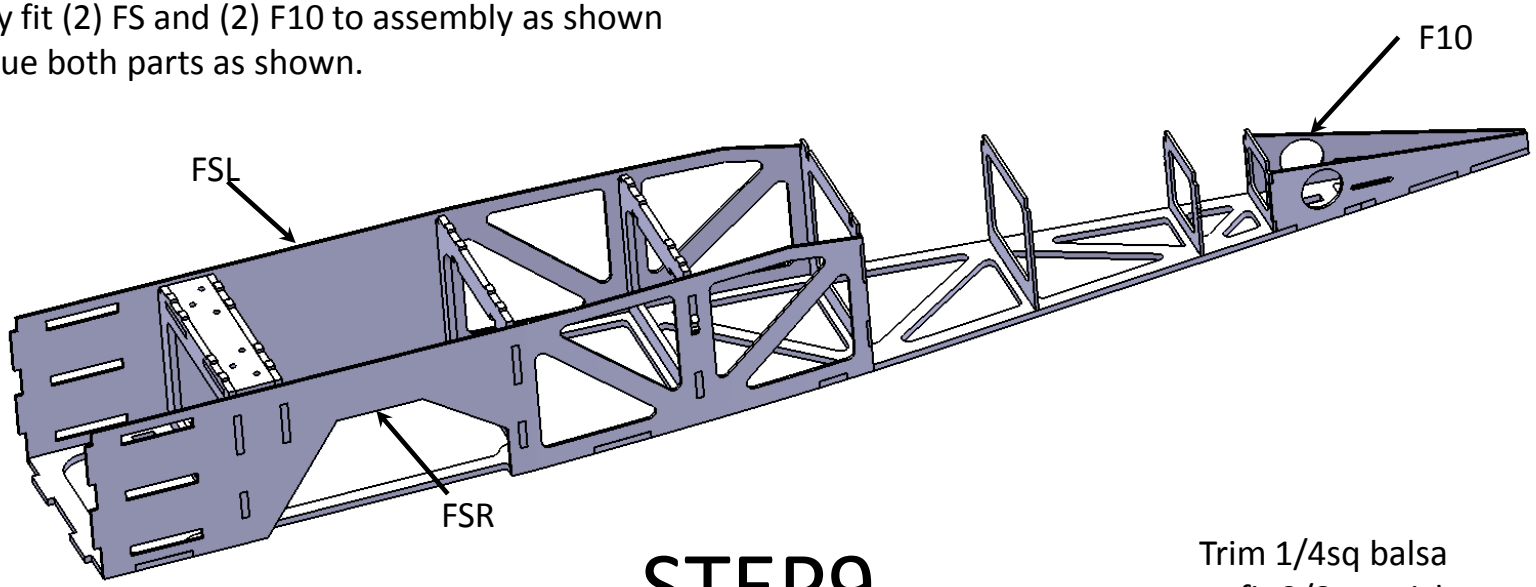
STEP7

1-Dry fit first. Install STEP6 assy and F4 to F9.
2-Glue all parts over FC1. Make sure that they are perpendicular to FC1 assy.



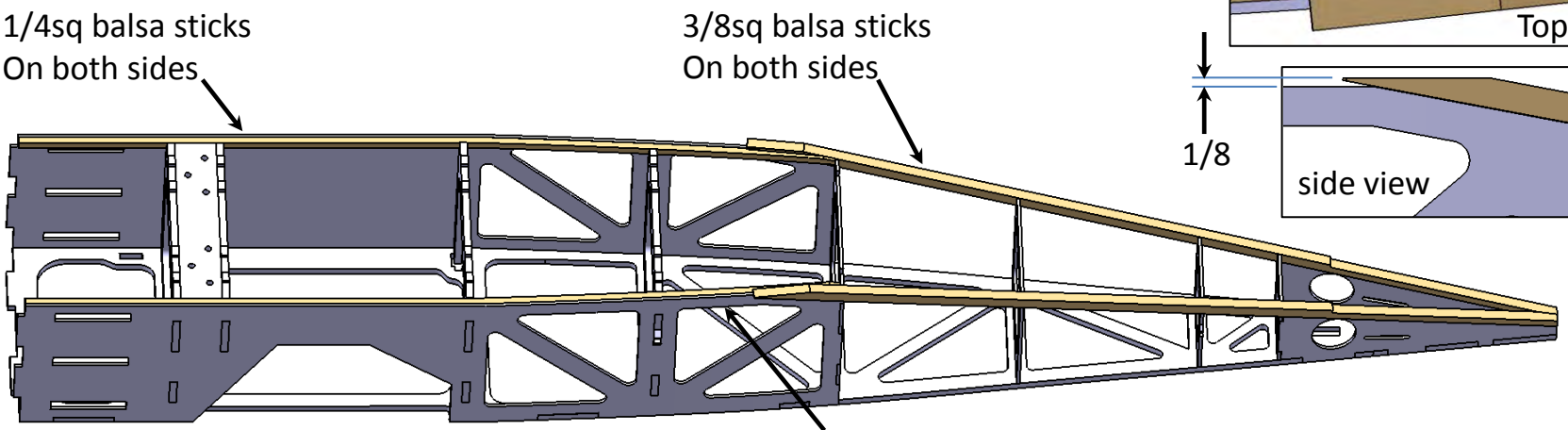
STEP8

1-Dry fit (2) FS and (2) F10 to assembly as shown
2- Glue both parts as shown.



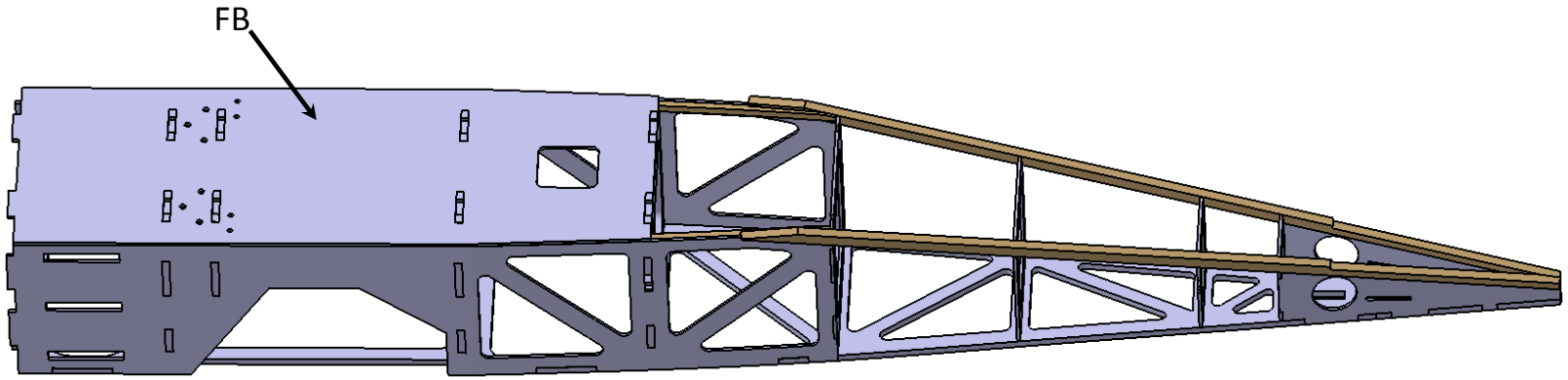
STEP9

1-Glue (2) 3/8 sq balsa 28in long on rear of fuselage
2-Fit and glue ¼ sq balsa as shown



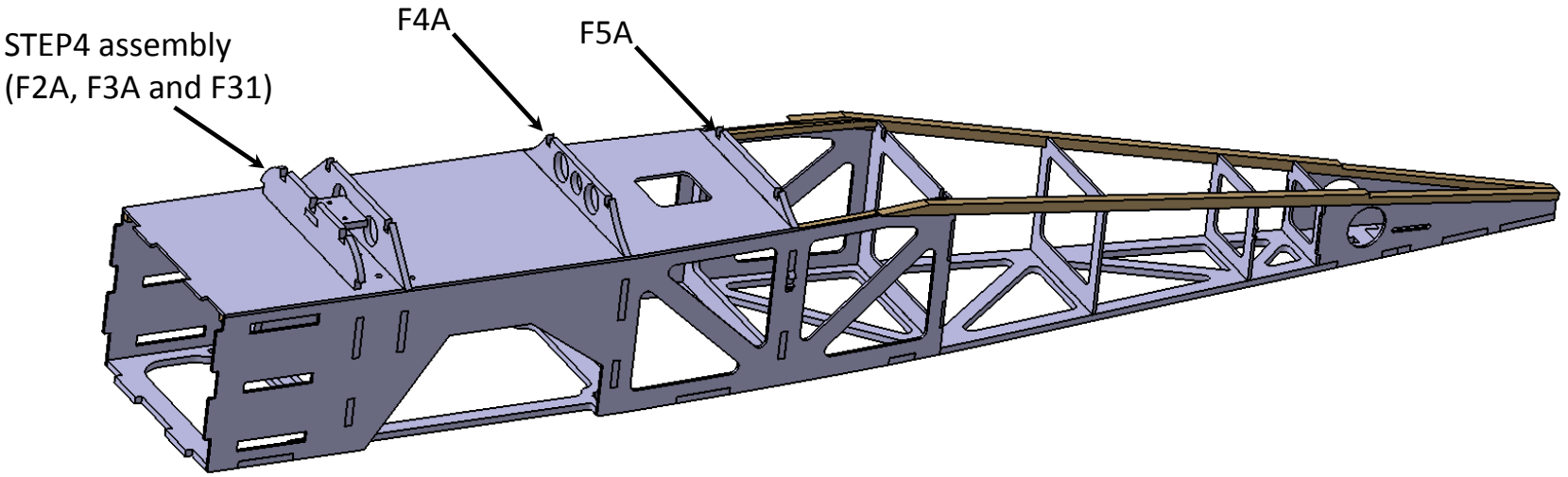
STEP10

1-Dry fit FB over assembly as shown
2- Glue FB as shown.



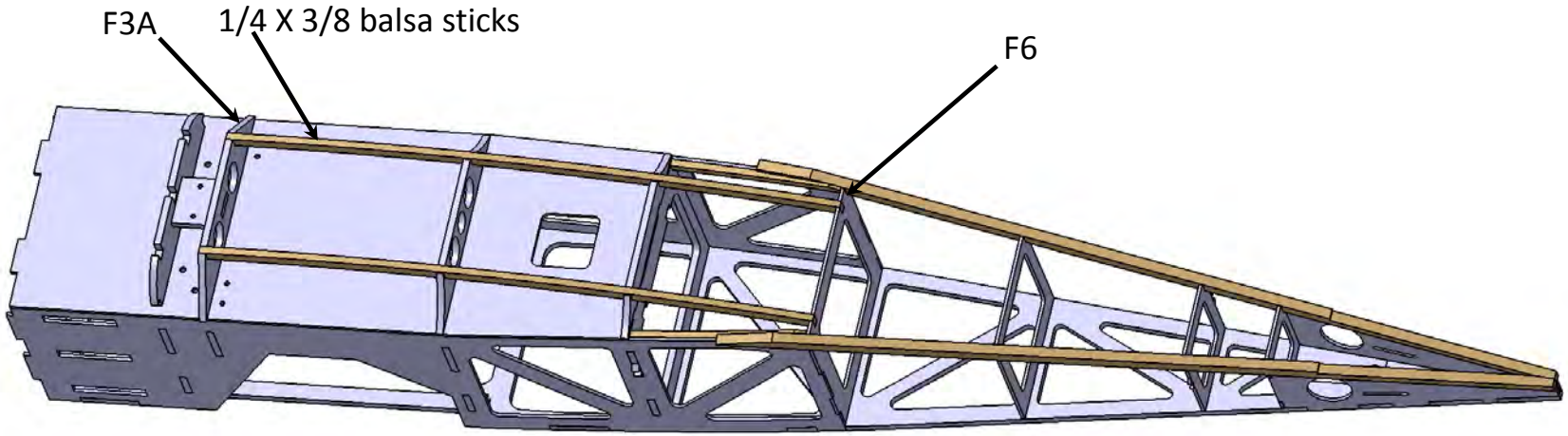
STEP11

1-Dry fit and glue STEP4 assembly, F4A and F5A as shown



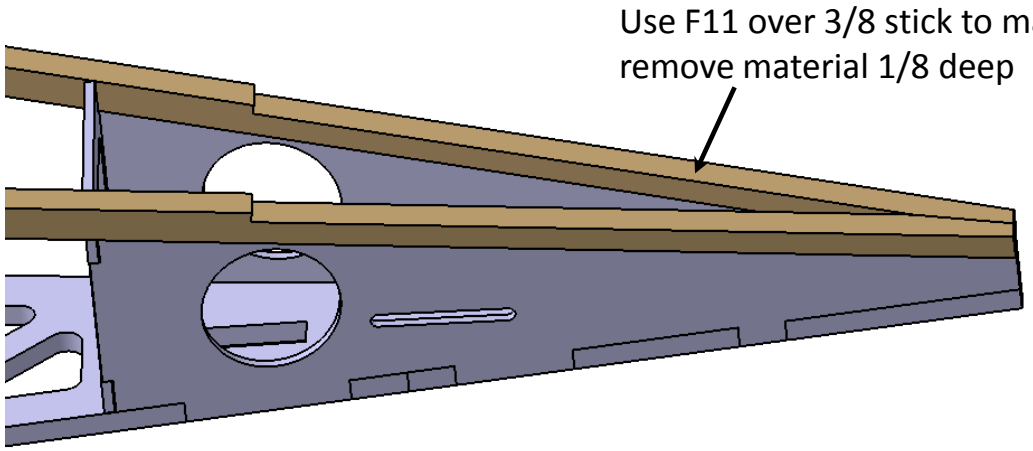
STEP12

1-Cut (2) 1/4 X 3/8 28 inches long balsa sticks
2-Glue sticks as shown between F3A and F6 as shown. Trim excess flush with F3A.



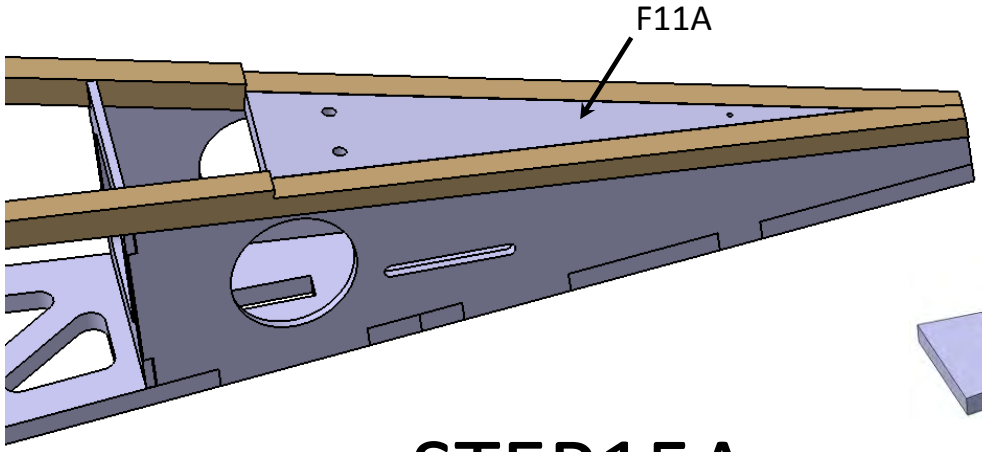
STEP13

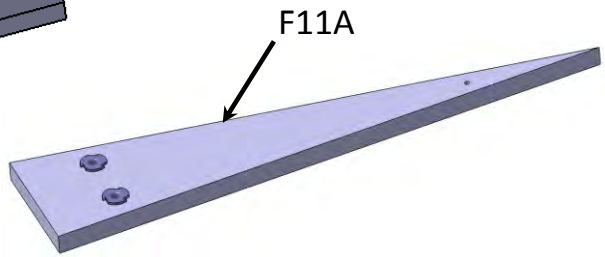
1-Use F11 to mark line on 3/8sq balsa stick and remove material 1/8 deep as shown prior installing F11 and F11A



STEP14

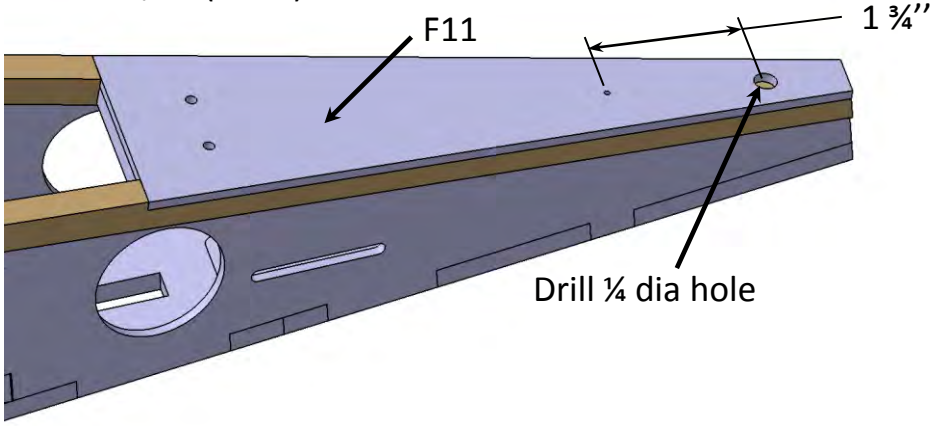
1-Install (2) 4-40 t-nuts under F11A as shown
2-Glue F11A flush with balsa cut-out made at step 13 as shown. T-nuts must be inside.



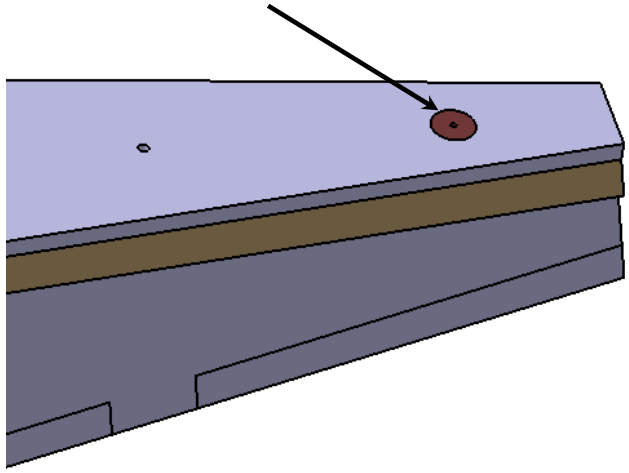


STEP15A

1-Glue F11 over F11A.
2-Drill 1/4 dia hole in 3/8 balsa at 1 ¾ inch from existing hole (use tail wheel to locate the hole properly)
3-Glue 1/4 dia dowel 3/4 inch long
4-Drill 5/64 (2mm) dia hole in the center of the dowel

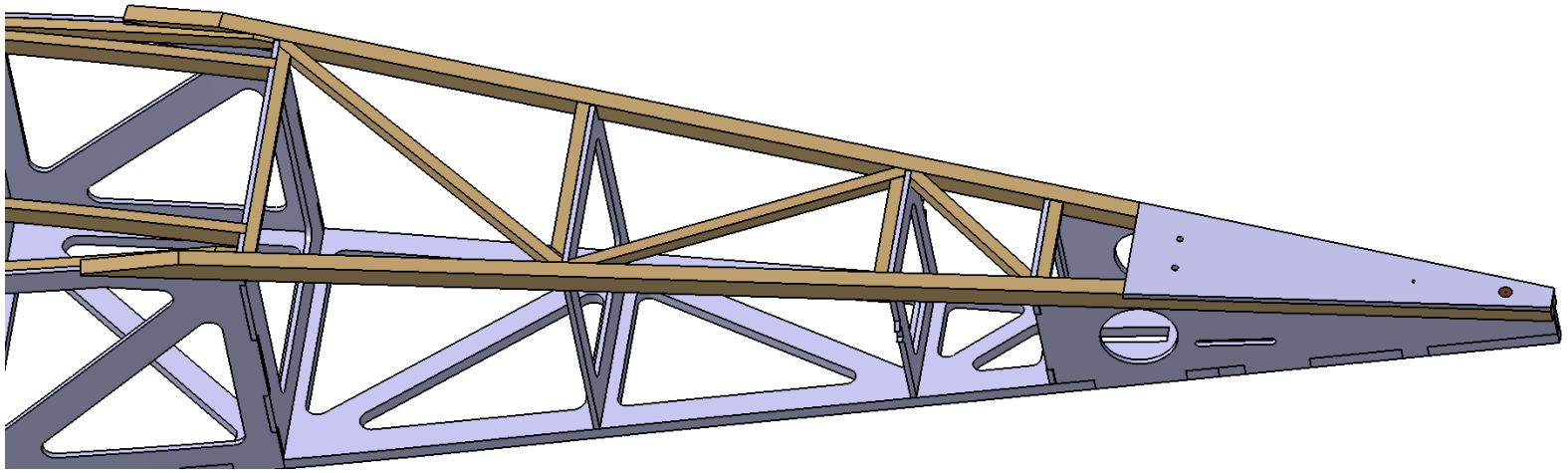


Glue 1/4 dia dowel
And drill 5/64 dia hole in center

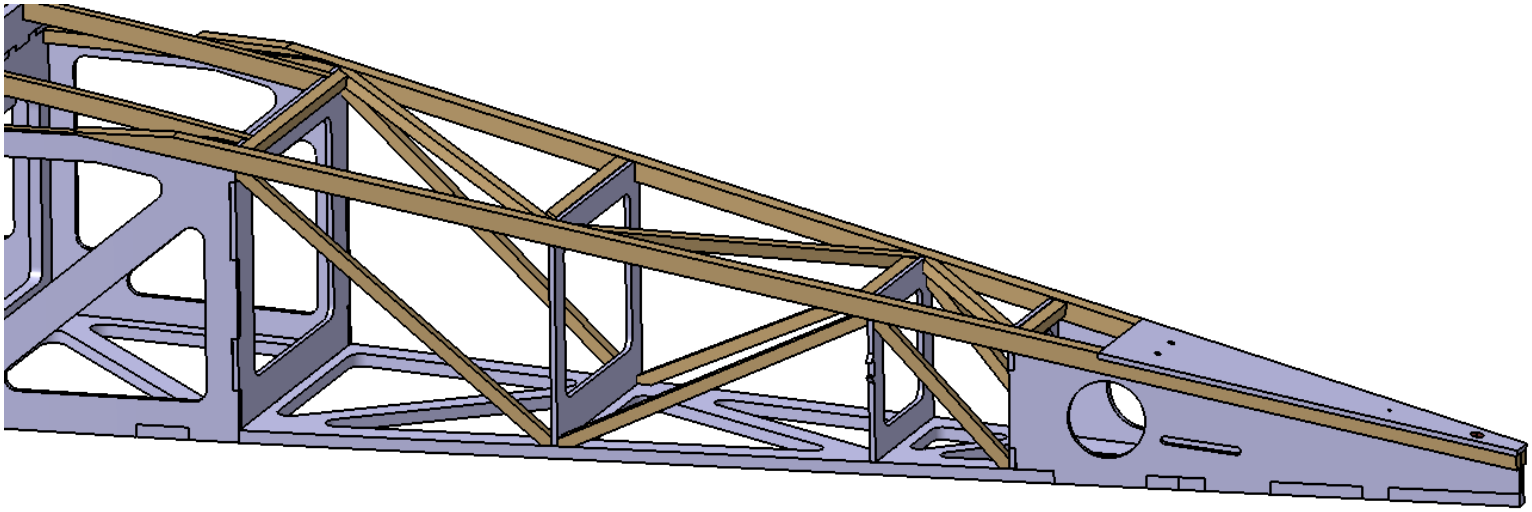


STEP15B

1-Cut and glue 3/8sq sticks to brace rear of fuselage bottom as shown



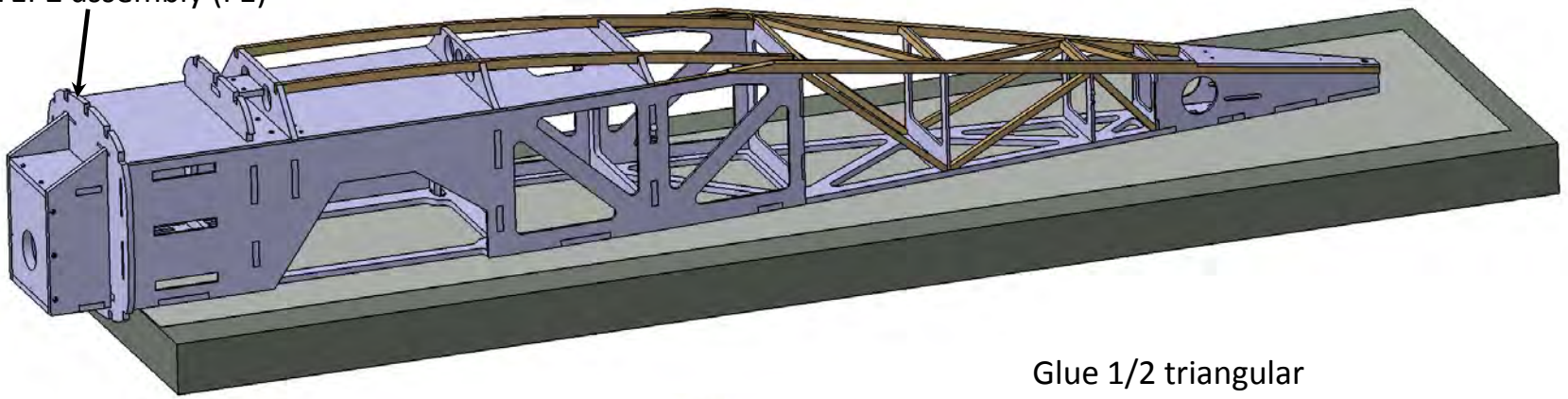
2-Cut and glue 3/8sq balsa sticks to brace sides of rear fuselage as shown as shown.



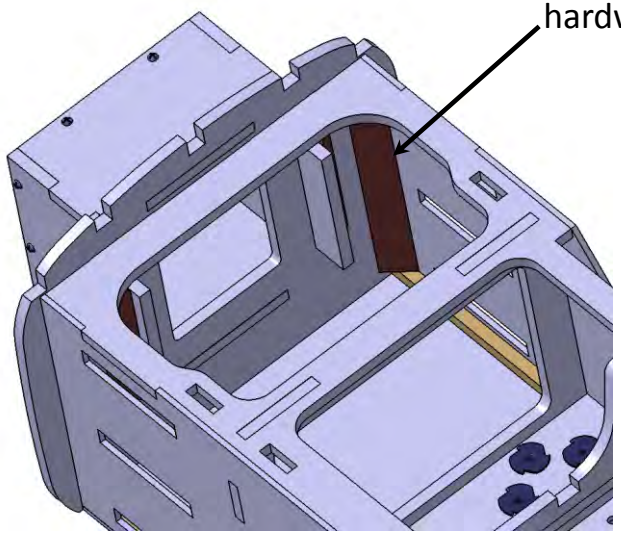
STEP16A

1-Move fuselage so that the front end is a bout an inch in front of building table.
2-Dry fit first and glue F1 assembly (step2) to fuselage assembly as shown.
3-Cut (2) 1/2 triangular hardwood sticks 5 inches long and glue them inside fuselage as shown on both sides.

STEP2 assembly (F1)



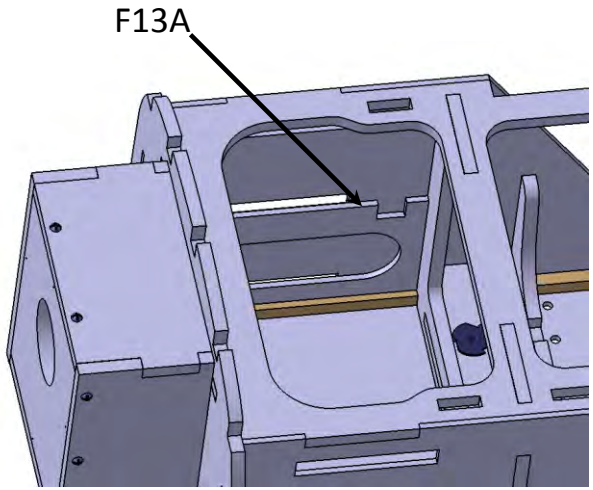
Glue 1/2 triangular hardwood both sides

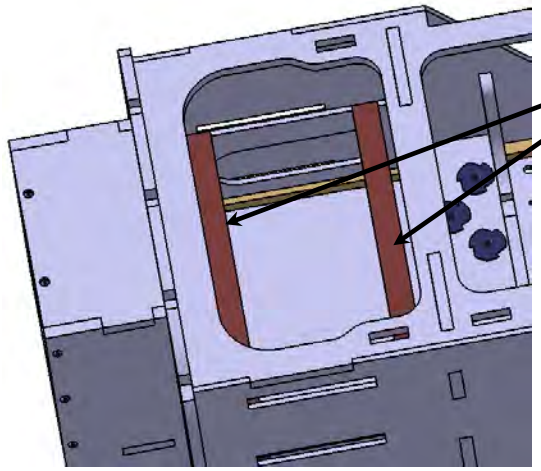


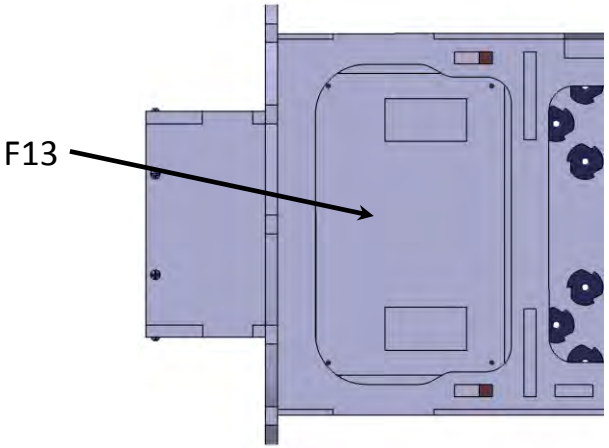
STEP16B

1-Glue (2) F13A inside fuselage (one on each sides). F16A must contact F2 and the
¼ sq balsa stick located on the bottom of the fuselage
2-Cut (2) 3/8 X ½ X 7 11/32 inches long hardwood sticks and glue them in slot found in F13A as shown.
3-Locate F13 over the hardwood block and drill 4 holes in hardwood stick using holes found in F13
4-Use (4) No2-1/2 long screws to secure F13. This plate is used for throttle and choke servo installation.

NOTE: It is highly recommended to install these servos prior completing the sheeting.







Throttle and choke servos installation

NOTE: It is highly recommended to install these servos prior completing the sheeting.

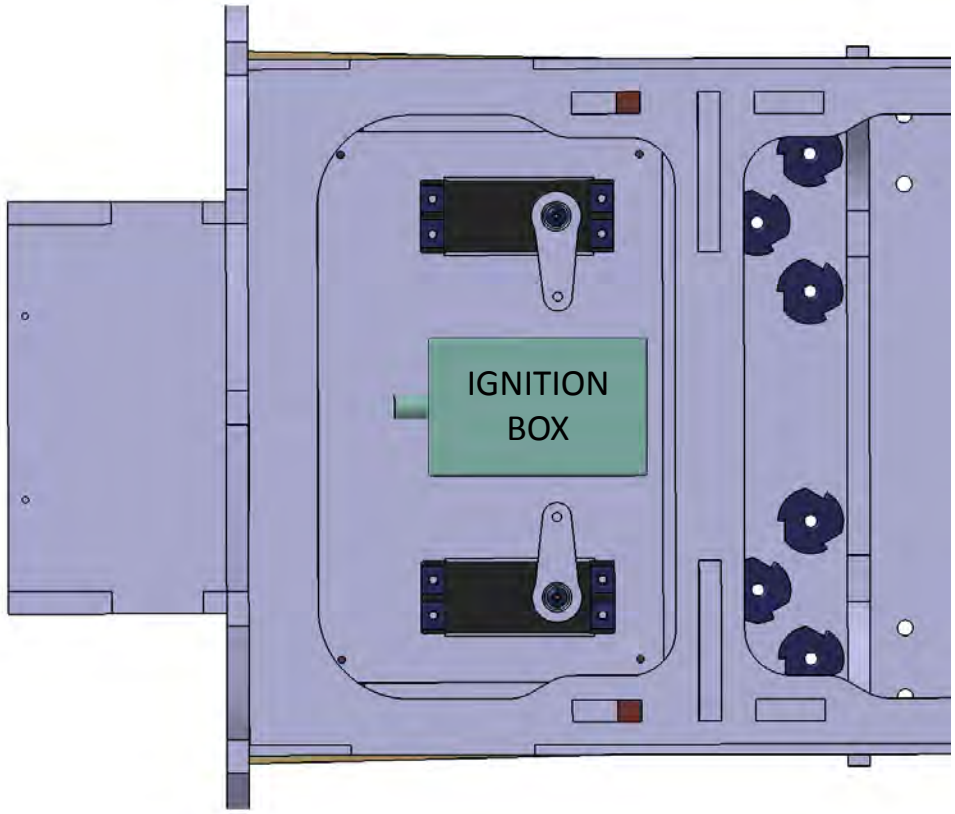
Since F13 is removable, Battery can be located under F13 in order to balance the plane

This servos installation is suggested but can vary depending on engine type and builder choice

It is also recommended to use velcro tape under ignition to help to maintain it in place and to reduce vibration.

A plastic tie-wrap is **mandatory** to secure ignition onto F13 (not shown in picture below)

It is also better to make engine installation and adjust pushrods as required at this moment.



STEP17

1-Glue (5) 3/8sq balsa sticks between F1 and F2A as shown.
2-Sand flush at both end.
3-Sand to match F1 and F2A shape

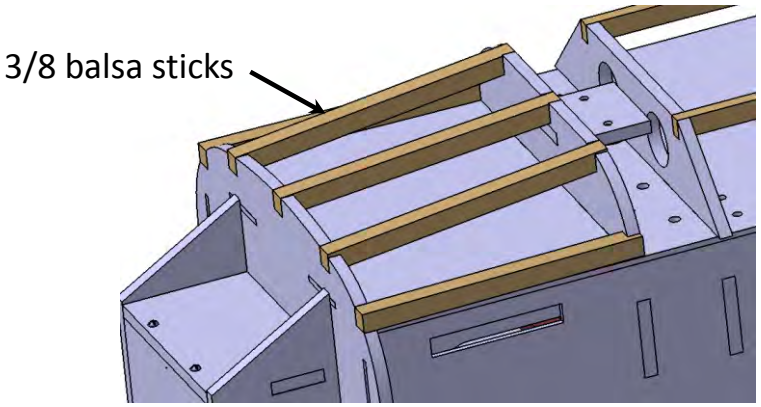
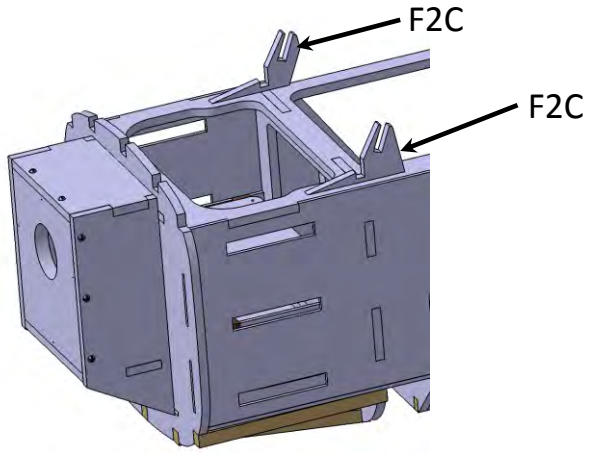
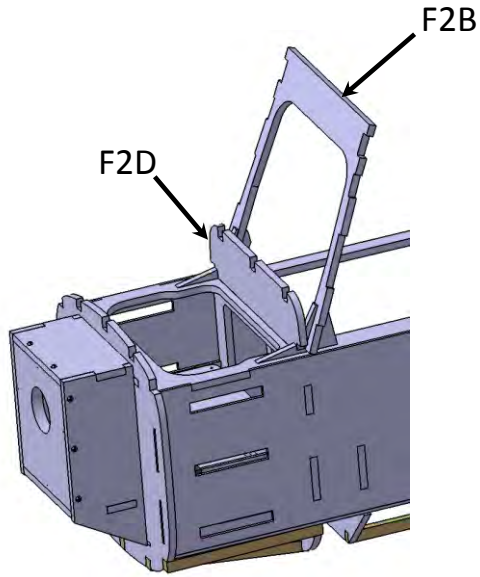


PHOTO SABLAGE ICI.

STEP18

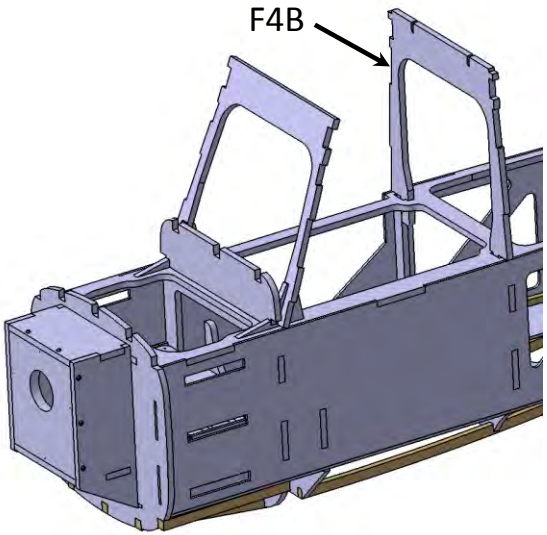
1-Glue (1) F2C and (1)F2E on both sides as shown.
2-Glue F2B and F2D as shown.

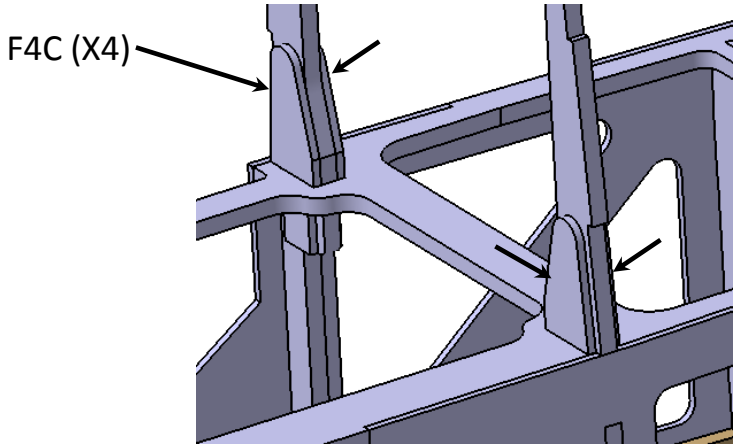




STEP19

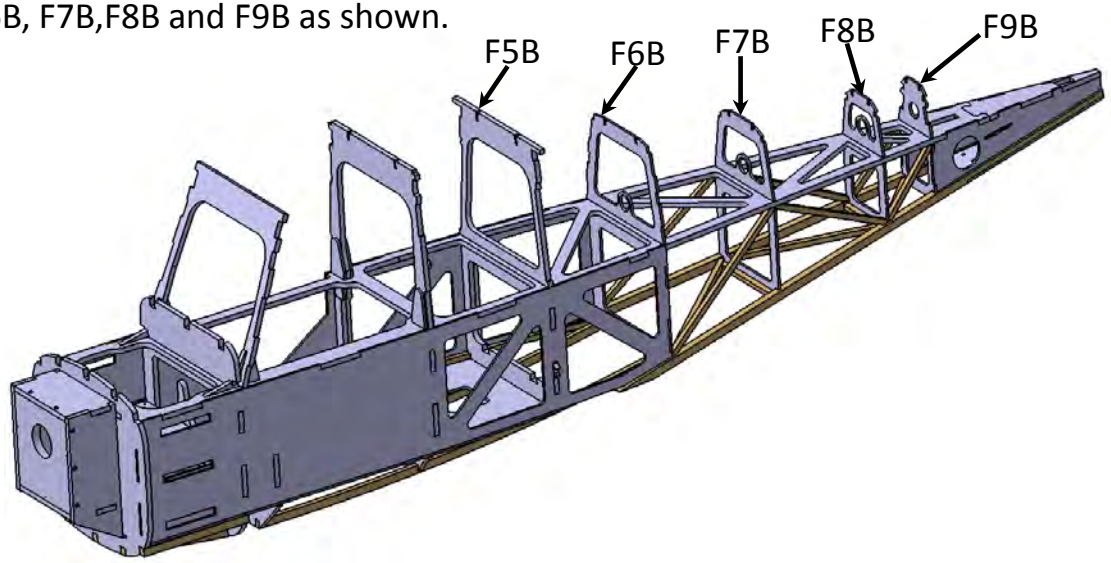
1-Glue F4B as shown.
2-Glue (4) F4C on front and rear, each sides of F4B





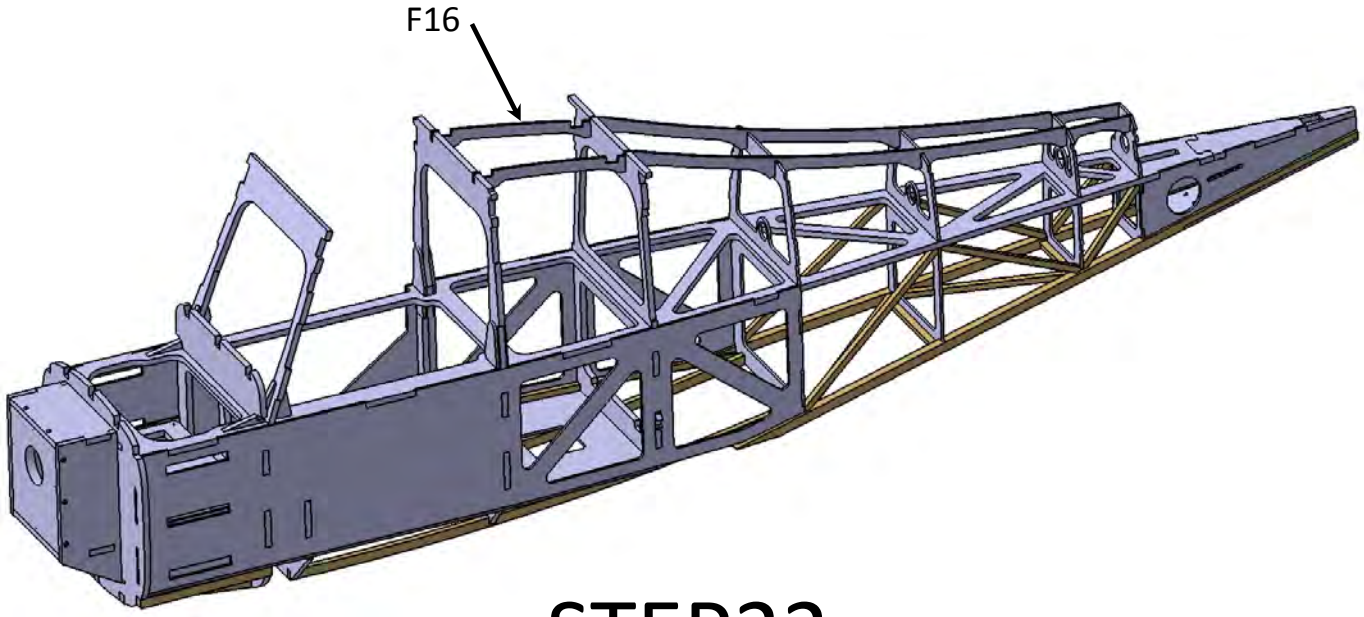
STEP20

1-Glue F5BB, FF6B, F7B,F8B and F9B as shown.



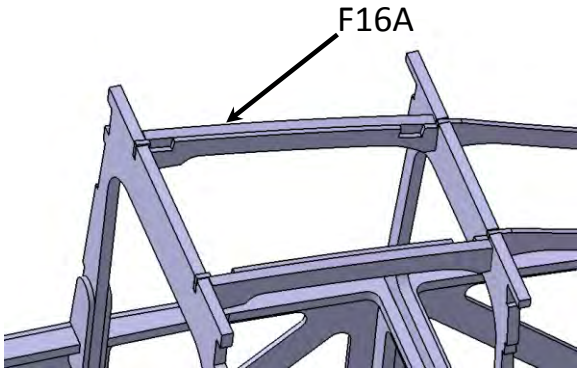
STEP21

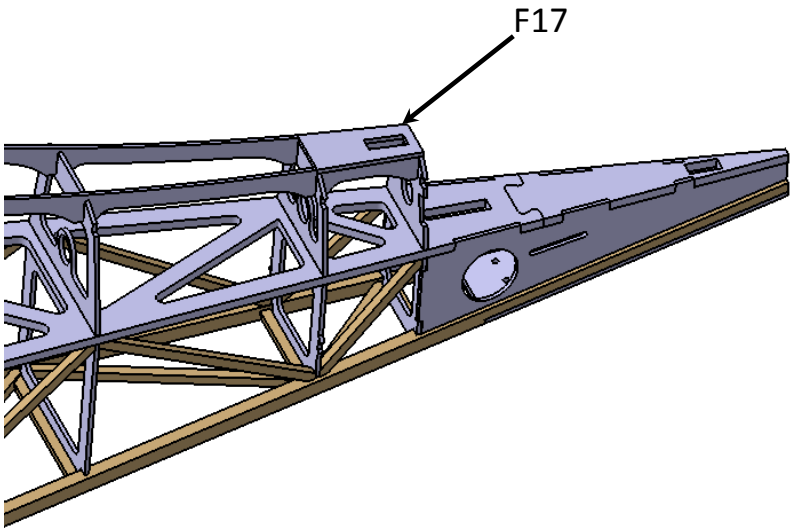
1-Glue (2) F16 as shown.



STEP22

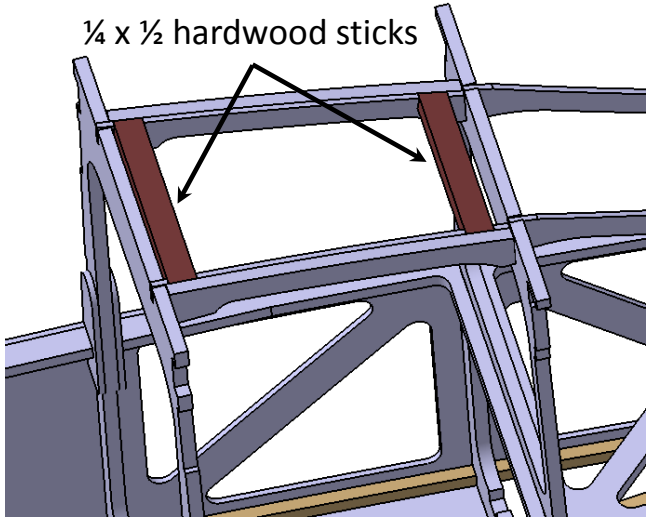
1-Glue F16A outside F16 as shown.
2-Glue F17 as shown.

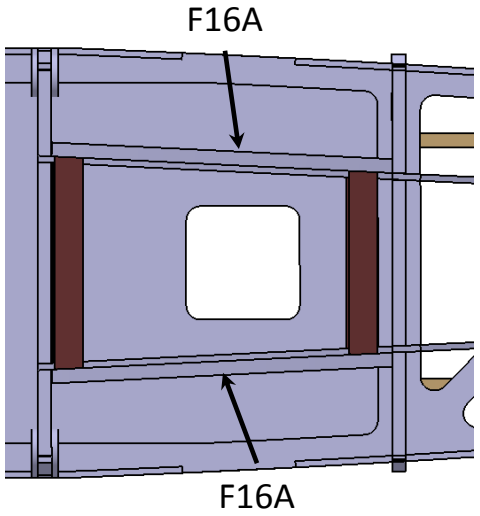




STEP23

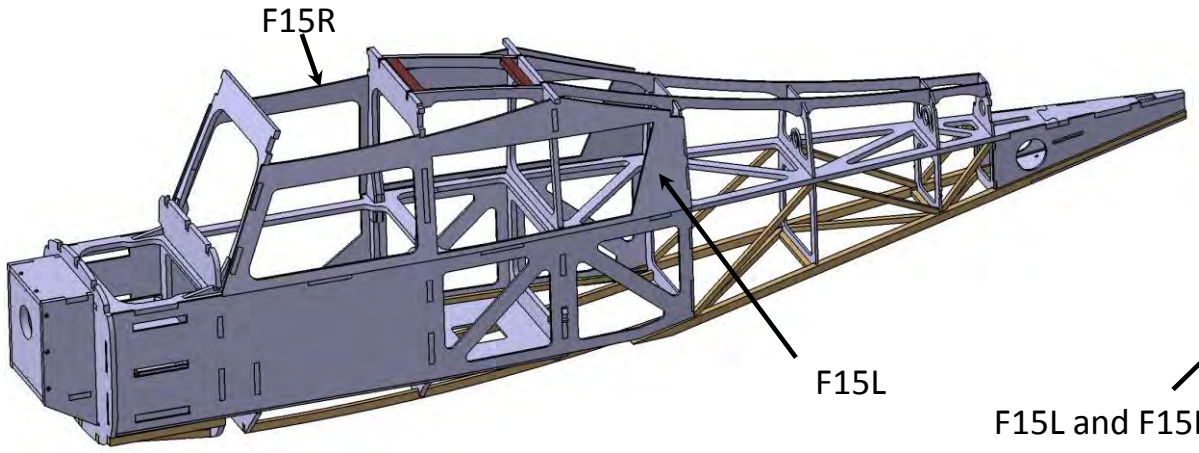
1-Cut (2) 1/4 X 1/2 hardwood sticks. They should fit between both F16A
2-Glue (2) 1/4 X 1/2 hardwood sticks as shown.

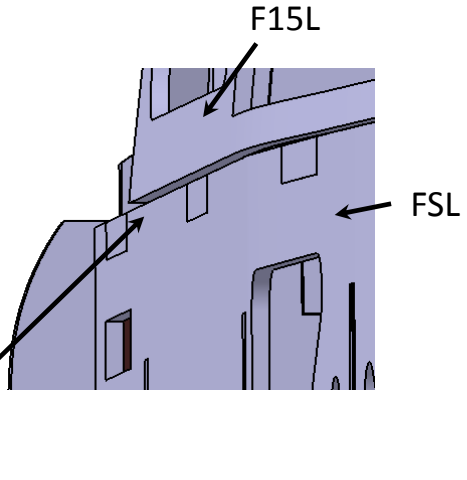




STEP24

1-Glue F15 as shown on both sides.

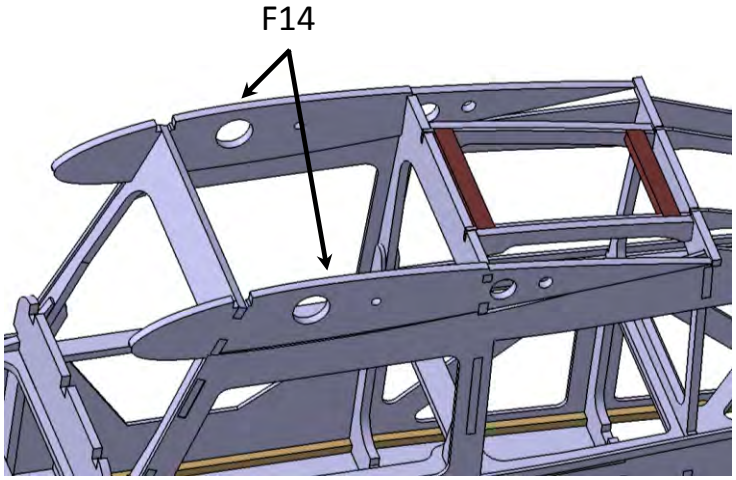


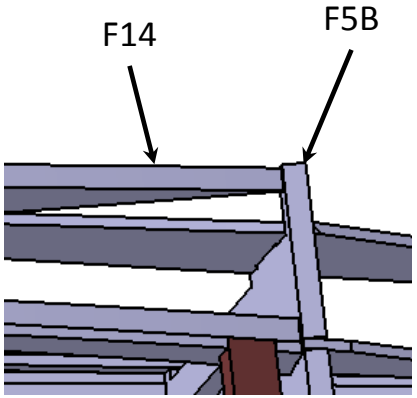


F15L and F15R not flush with FSL and FSR

STEP25

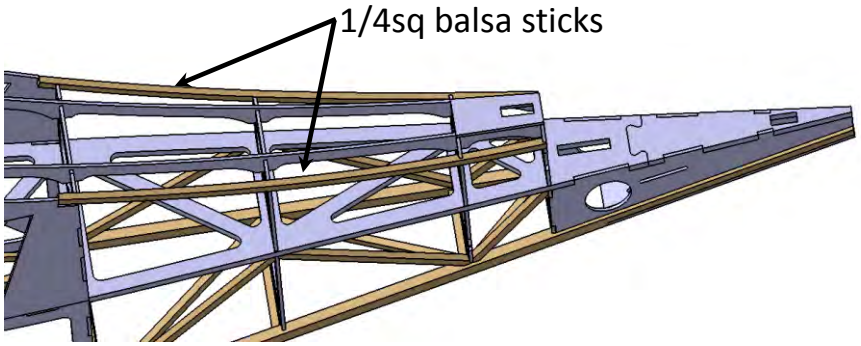
1-Glue (2) F14 as shown.
F14 should be flush with tabs on top of F5B.

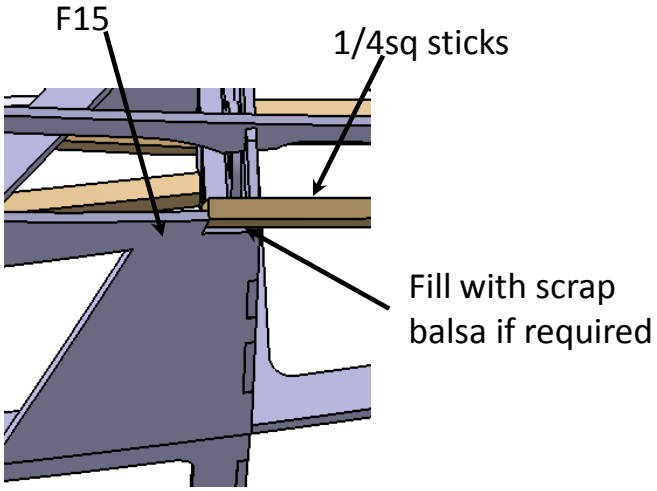




STEP26

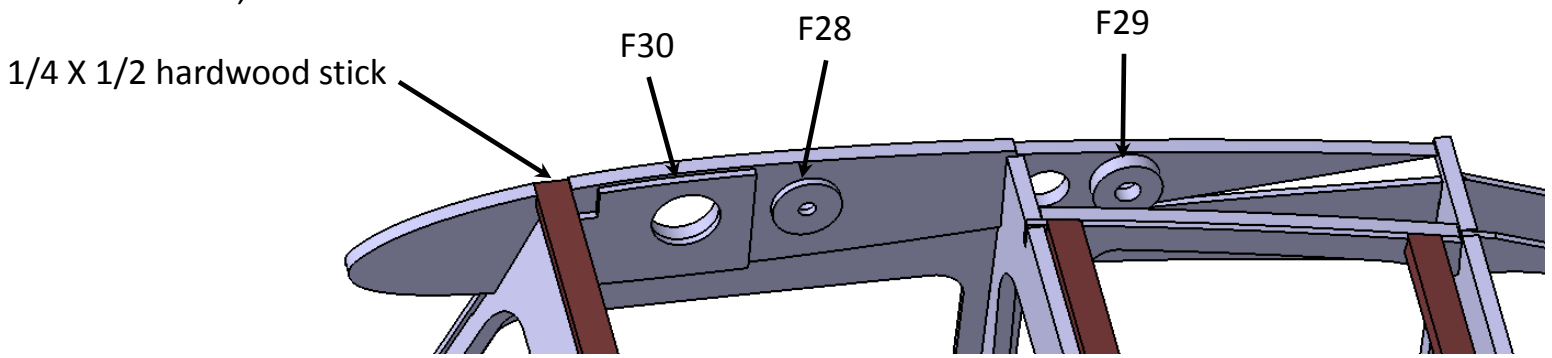
1-Glue (2) 1/4sq balsa stick as shown. They must locate on F15
2-Trim flush with F9B.





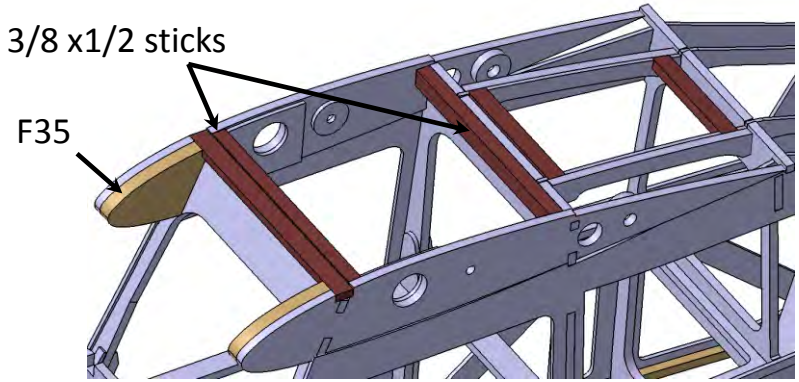
STEP27

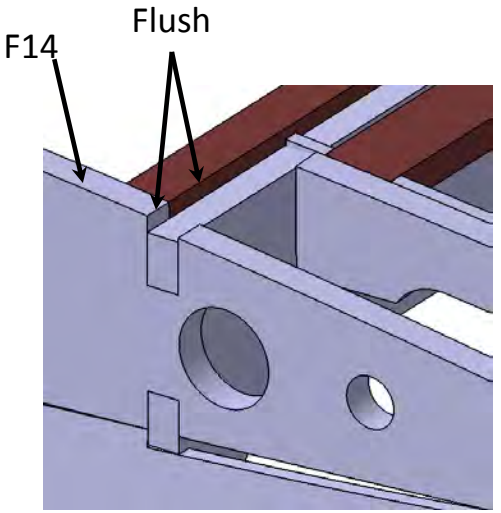
1-Cut (1) 1/4 x 1/2 hardwood stick and glue as shown.
2-Glue F28, F29 and F30 both sides as shown.



STEP28

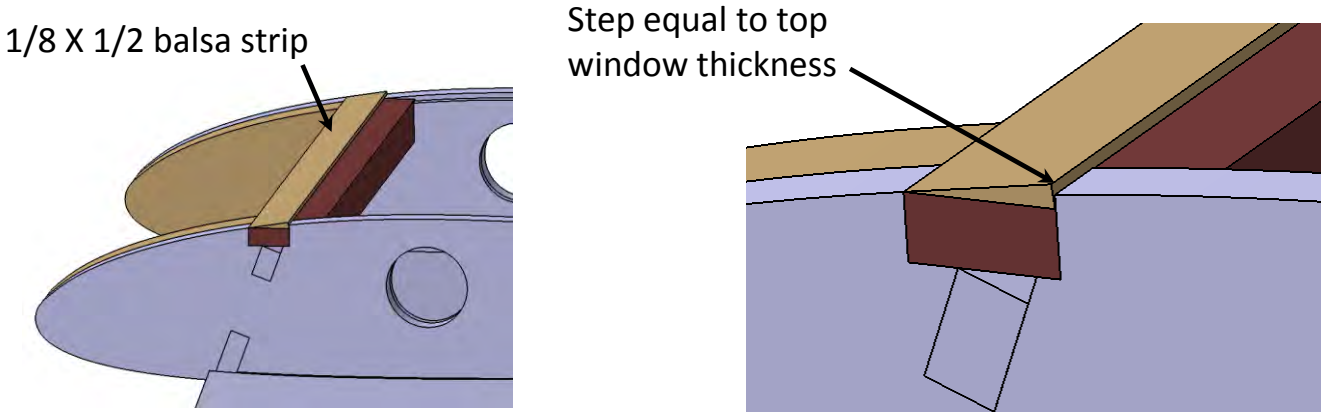
1-Cut (2) 3/8 x 1/2 hardwood stick as shown.
2-Glue rear stick flush with F14 slot top.
3-Glue front stick in F30 slots.
4-Glue (2) F35 on both sides as shown.





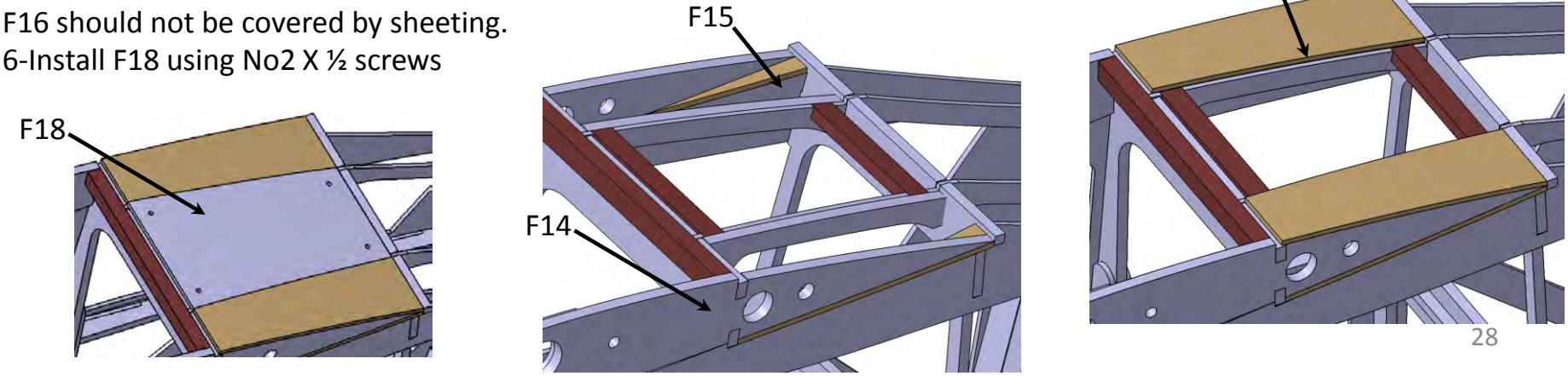
STEP29

1-Cut (1) 1/8 x 1/2 balsa strip and glue as shown.
2-Sand strip to follow airfoil shape. Use top window as a gauge to keep step on the back.
(do not sand with window installed to avoid damaging the window surface)



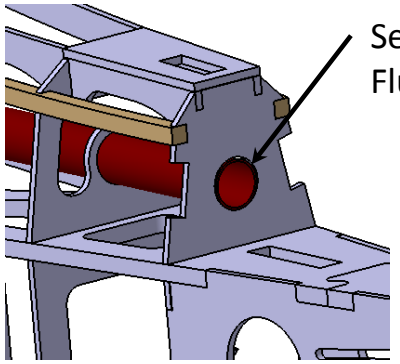
STEP30

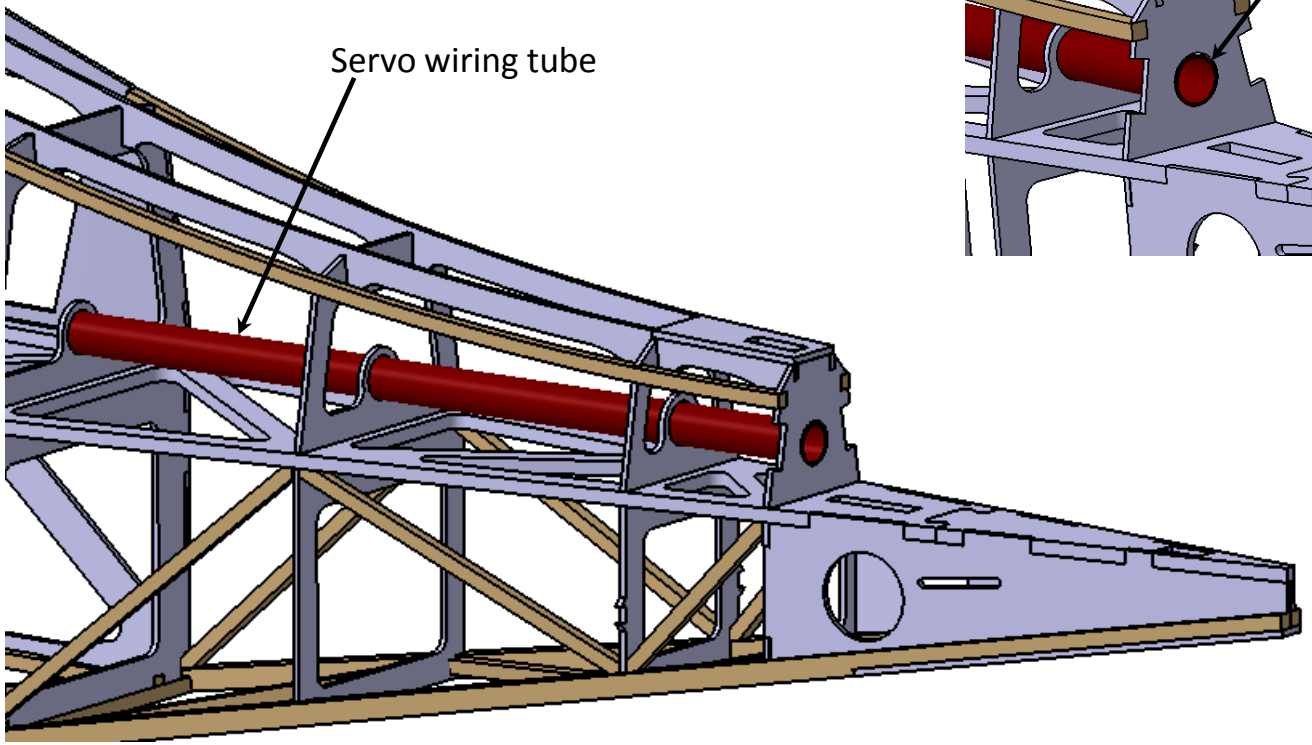
1-Cut (2) 1/8 sheeting and fit as required.
2-Glue bottom sheeting as shown between F4B and F5B
3-Trim flush with F14 side and F15 inside face.
4-Repeat procedure for top sheeting. Front end should be flush with F18 cover
5-Top sheeting should be flush to F14 outside and with F16A inside.
F16 should not be covered by sheeting.
6-Install F18 using No2 X ½ screws



STEP31a

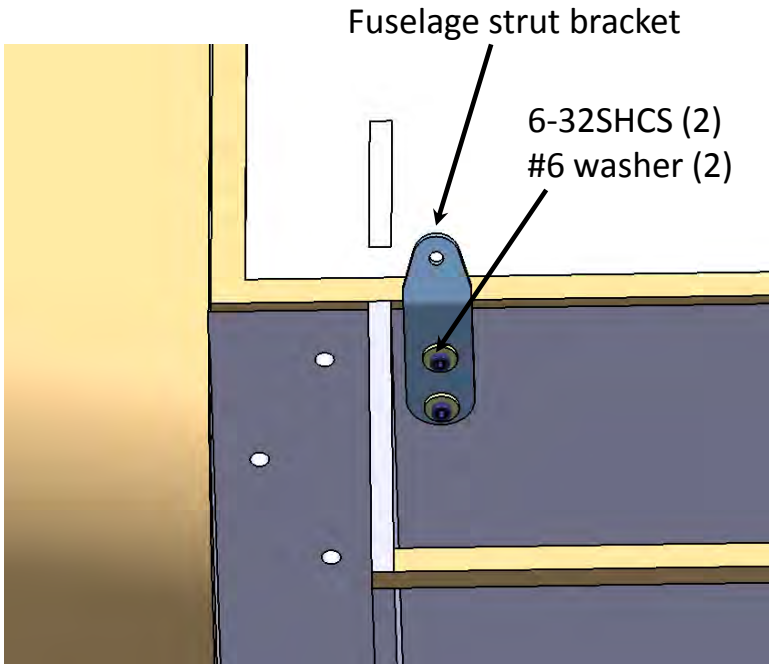
1-Cut (1) servo wiring tube 15 inches long.
2-Glue the tube flush with F9B and apply glue in holes of F6B to F8B

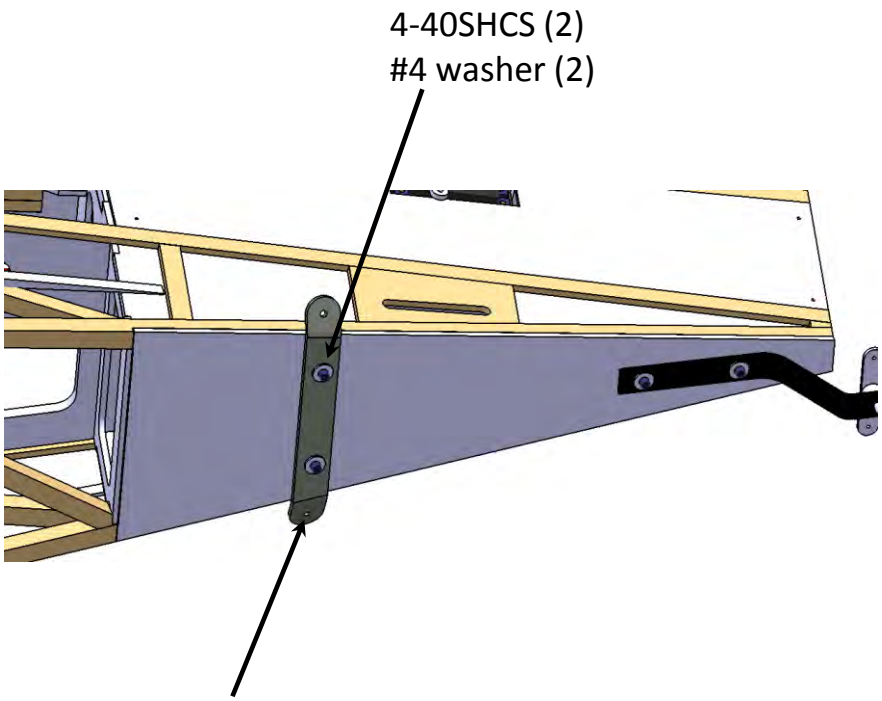


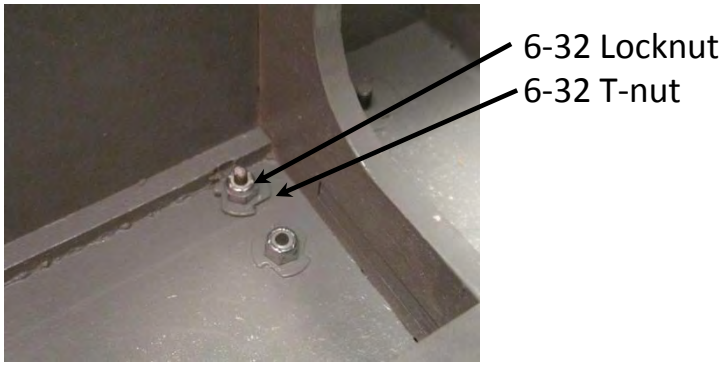


STEP31b

1-Install (4) 6-32 T-nuts inside the fuselage
2-Install fuselage front brackets as shown using (4) 6-32 SHCS 5/8 long and (4) #6 washer as shown. Use (2) 6/32 locknuts inside the fuselage to secure screws as shown
3-Install tail flying wire bracket as shown using (2) 4-40 SHCS 1/2 long and (2) #4 as shown

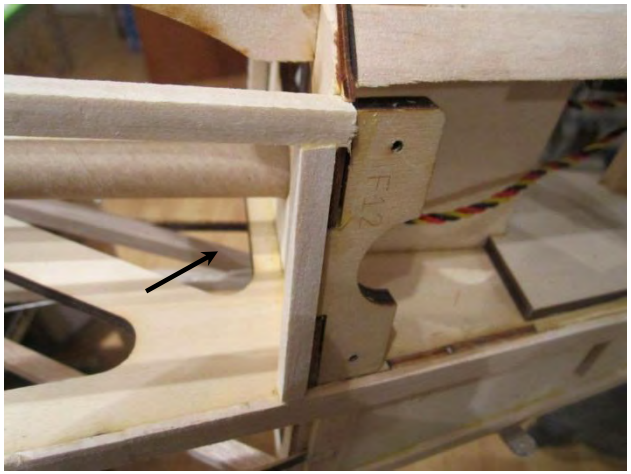




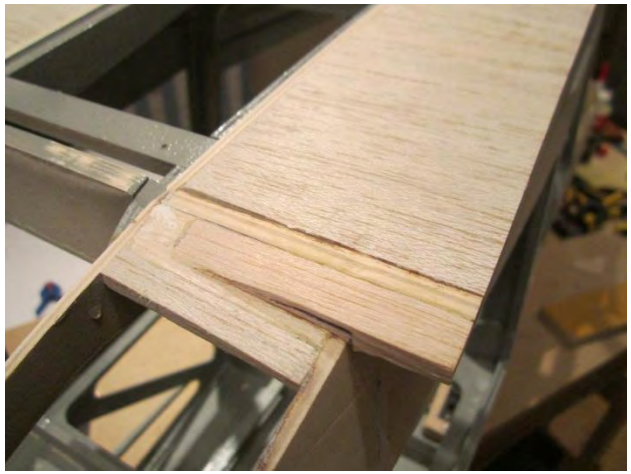


FUSELAGE ASSY PICTURES

1-Add scrap balsa to support covering properly as shown



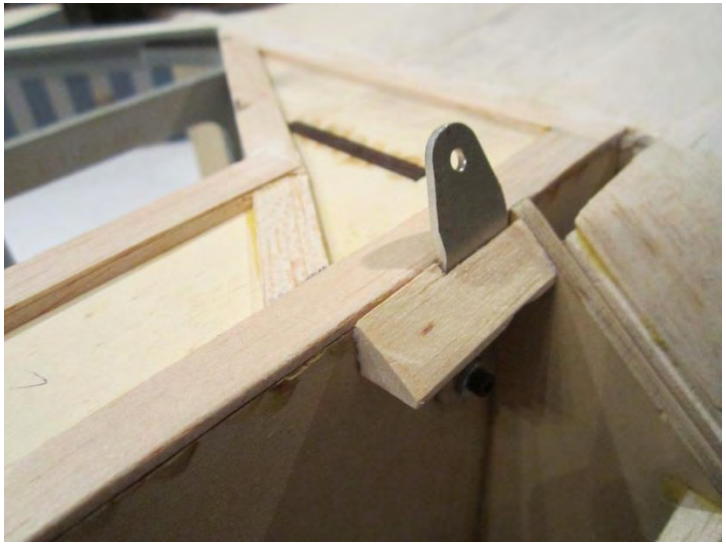
¼ sq balsa in front of F9B



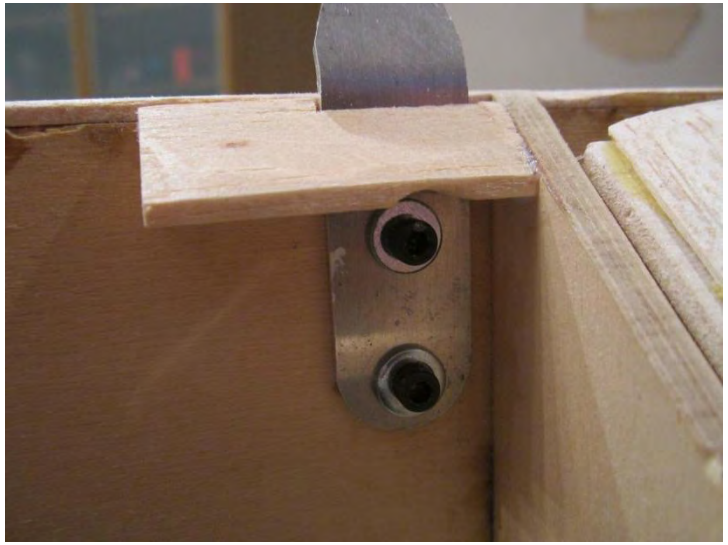
Scrap balsa at rear of F5Band between F15 and F16

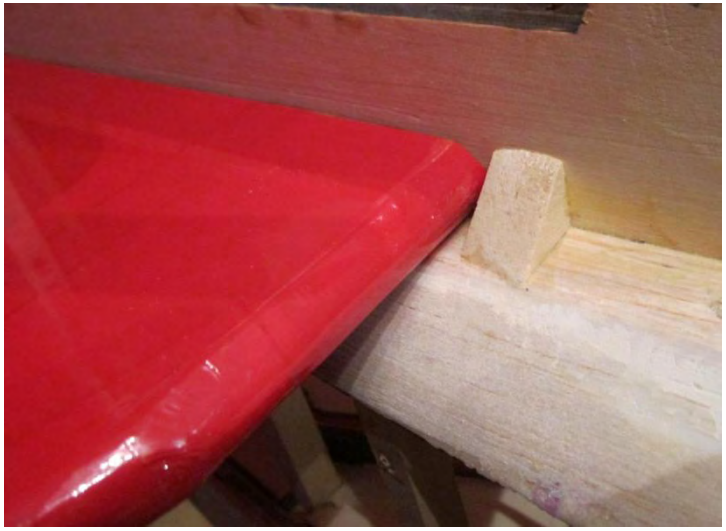
FUSELAGE ASSY PICTURES

1-Add scrap balsa to support covering properly as shown



Add a piece of scrap balsa around bracket



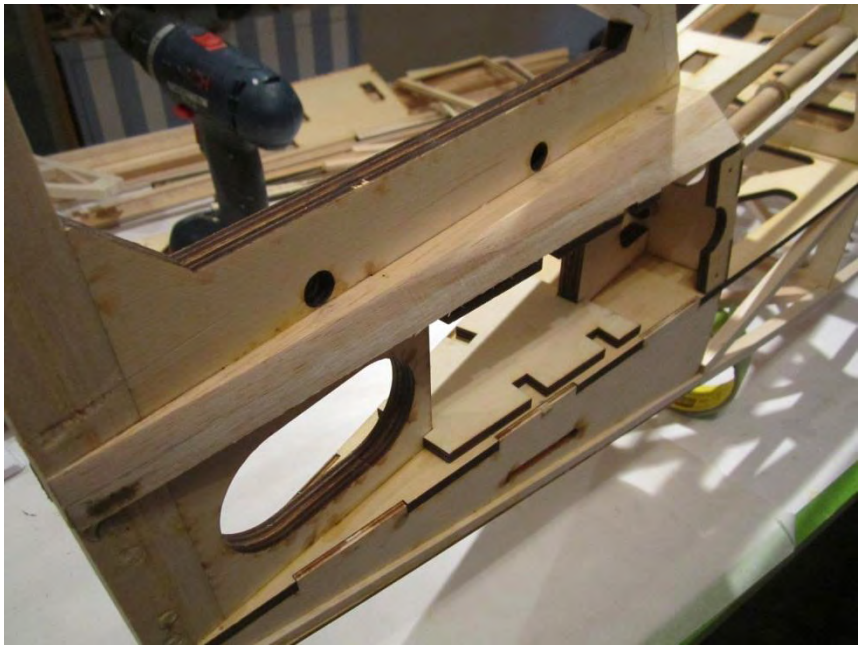


Add a piece of scrap balsa in front of stab

Sand RF2 as shown

FUSELAGE ASSY PICTURES

1-Sand RF2 as shown.
2-Glue a piece of 1/8 balsa over F9B to match RF2 and allow proper covering installation

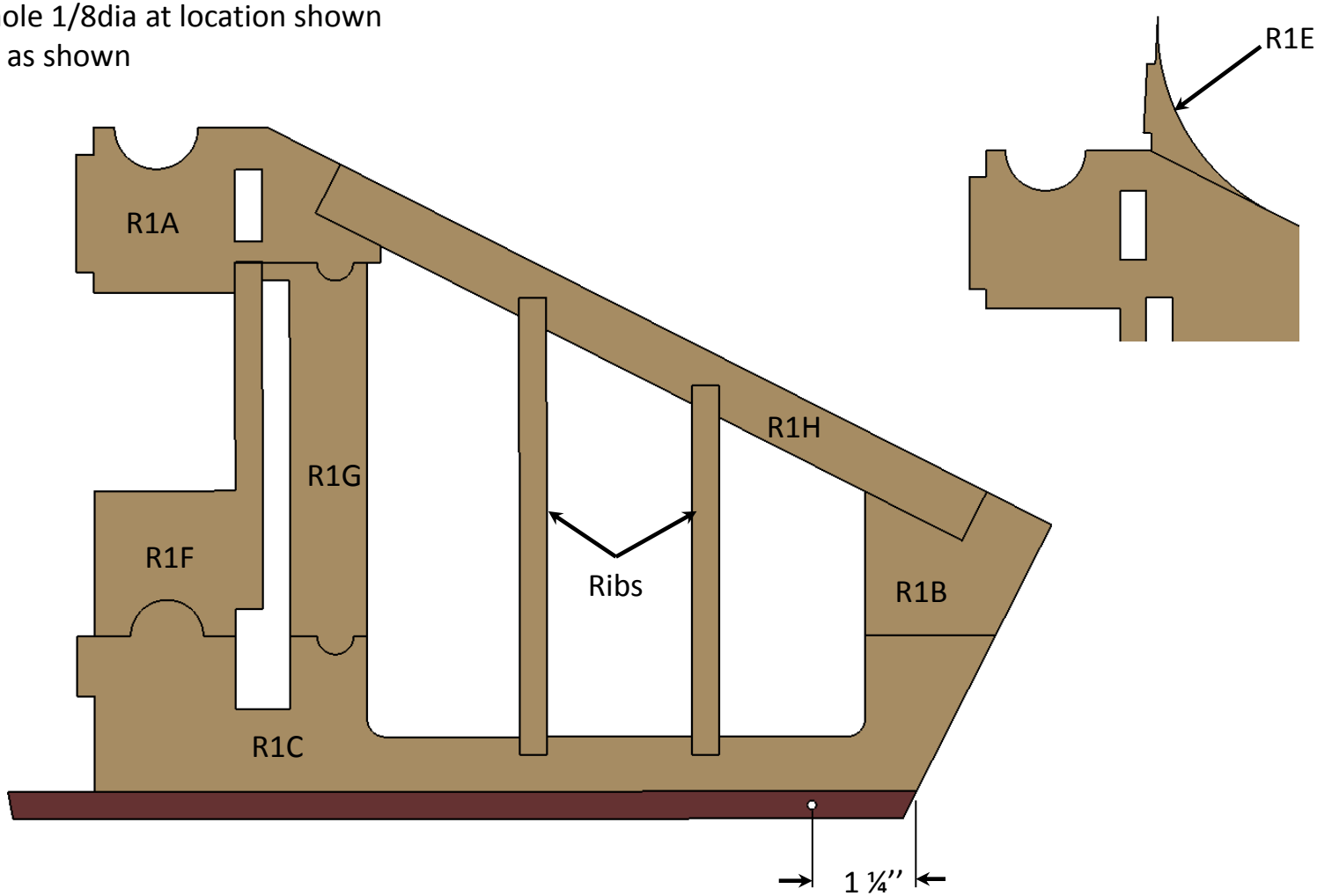


FUSELAGE ASSY PICTURES

1-Glue (2) scrap pieces of ½ x 1 ¼ leading edge stock and shape as shown
2-Sand blocks to fuselage shape once the front fuselage sheeting is installed as shown

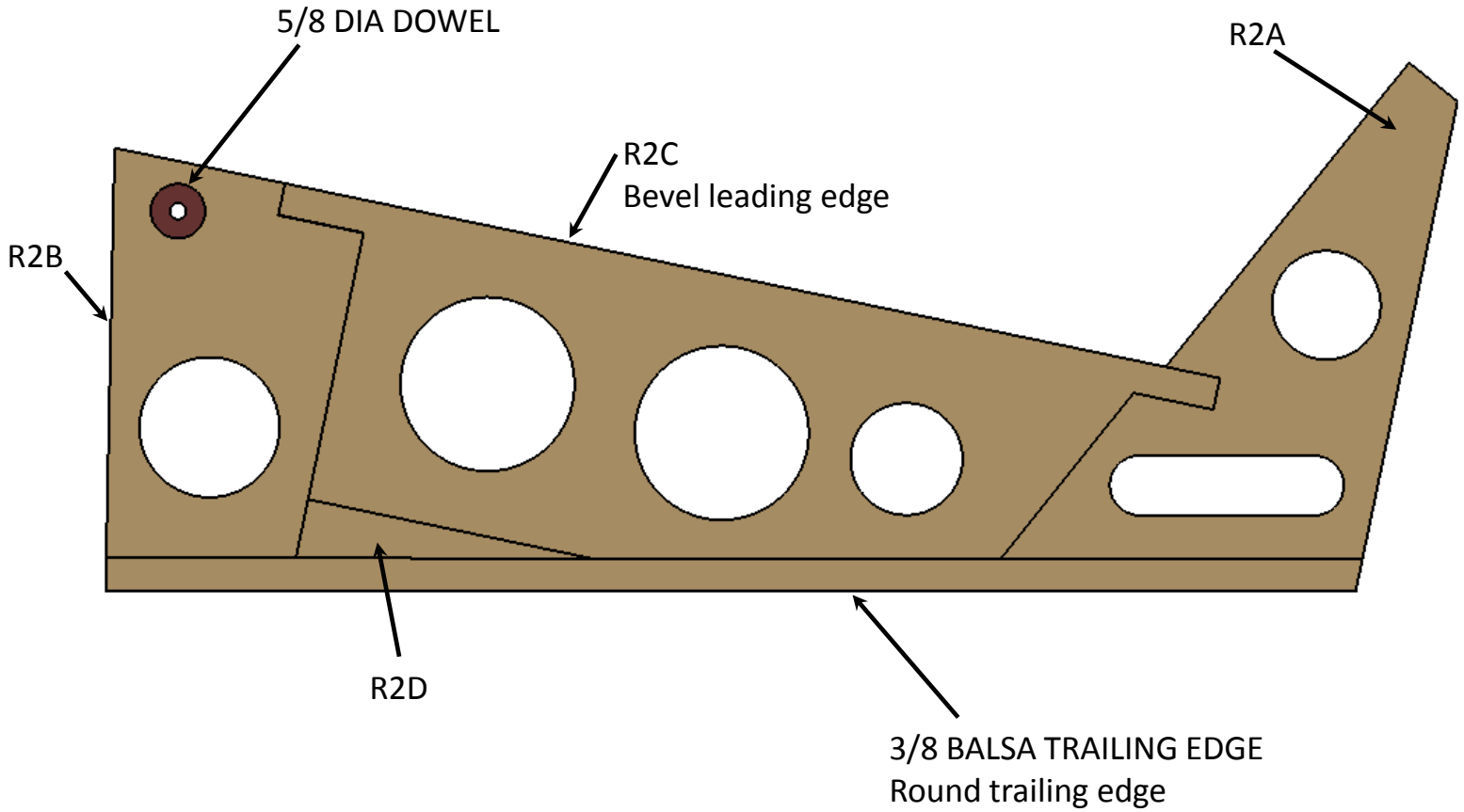
STEP32a

1-Cut (1) 3/8sq hardwood stick 12.625 long.
2-Glue fin frame using R1A, R1B, R1C, R1F, R1G and R1H
3-Cut (2) pieces of 3/8 sq balsa to make ribs
4-Glue 3/8sq hardwood stick to trailing edge of rudder fin assembly
5-Trim top of hardwood flush with top of fin
6-Trim bottom of hardwood flush with bottom of fuselage tail
7-Drill (1) hole 1/8dia at location shown
8-Glue R1E as shown



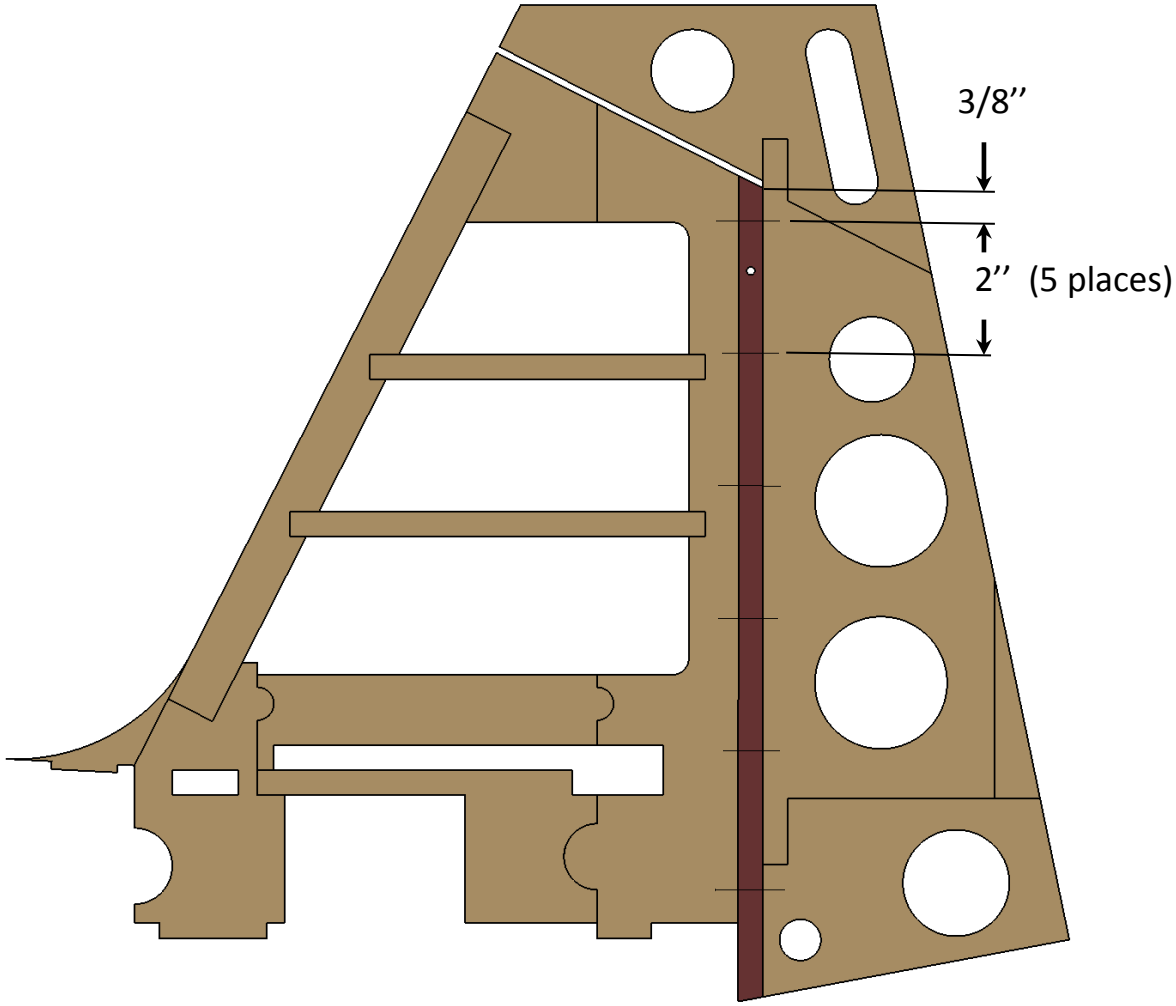
STEP32b

1-Glue R2A and R2B to R2C as shown.
2-Glue R2D to complete the rudder.
3-Cut a 3/8sq balsa stick 15 inches long
4-Glue a 3/8 sq balsa stick and trim both end
5-Round trailing edge and bevel 45 degrees on each side of leading edge



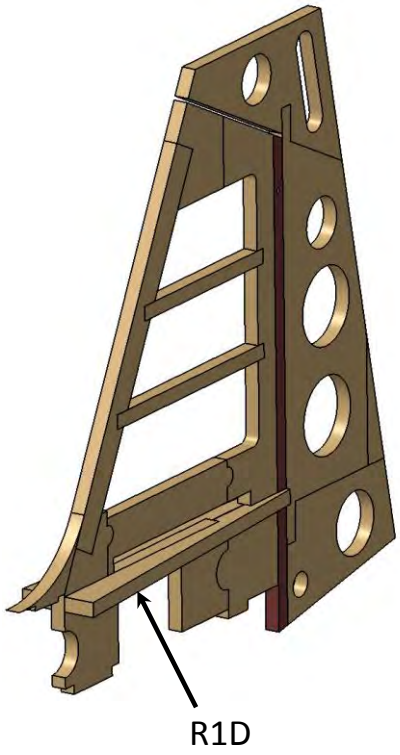
STEP32c

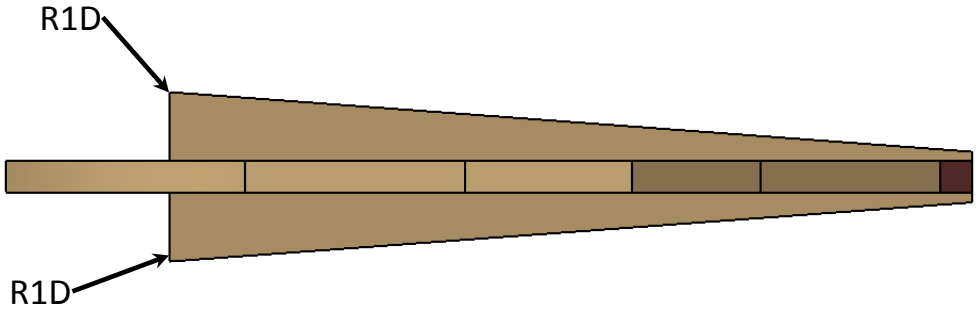
1-Mark lines as shown on both fin and rudder for Robart hinges (6 required)
7-Drill 3/16 dia holes using Robart drill jig on both fin and rudder

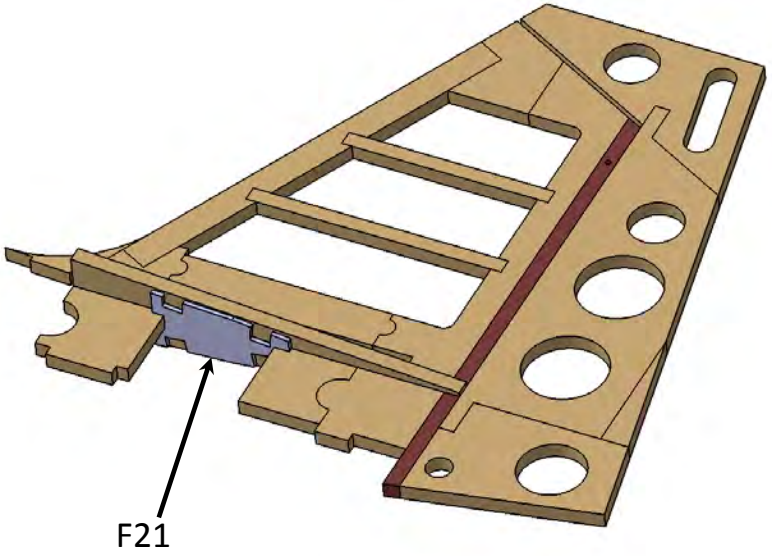


STEP32d

1-Glue (2) R1D on each side of rudder fin assembly as shown
2-Glue F21 as shown

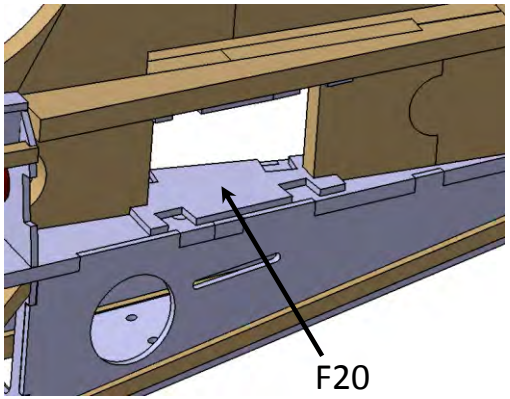


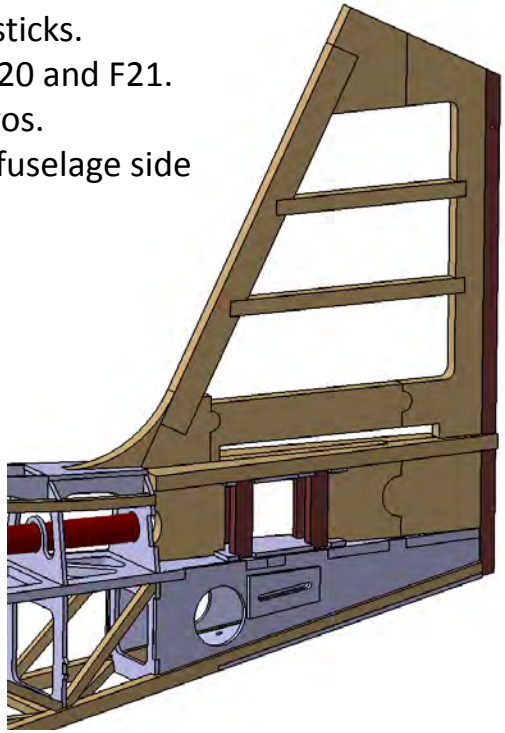


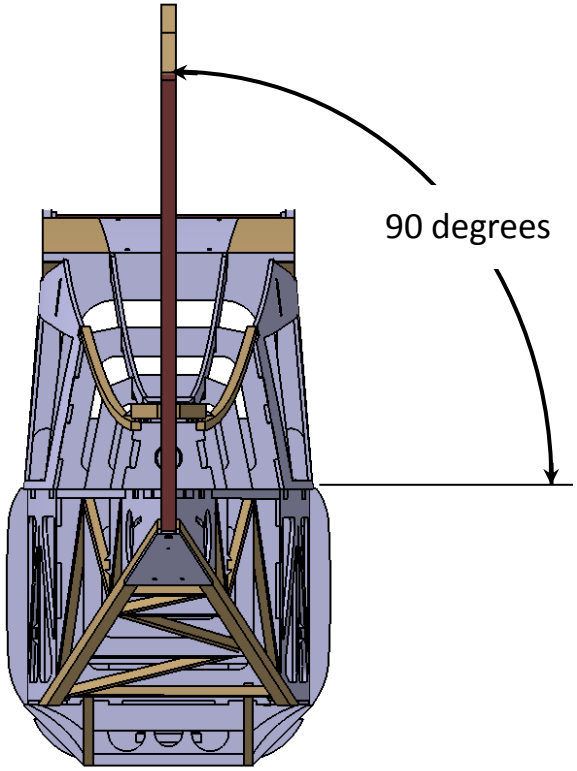


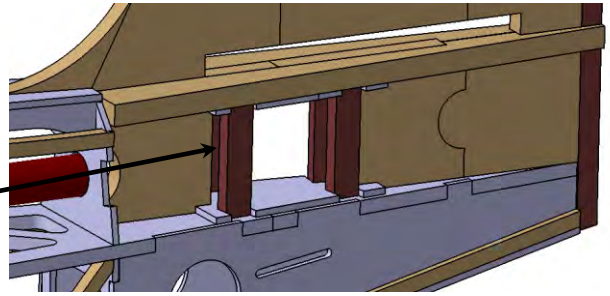
STEP33

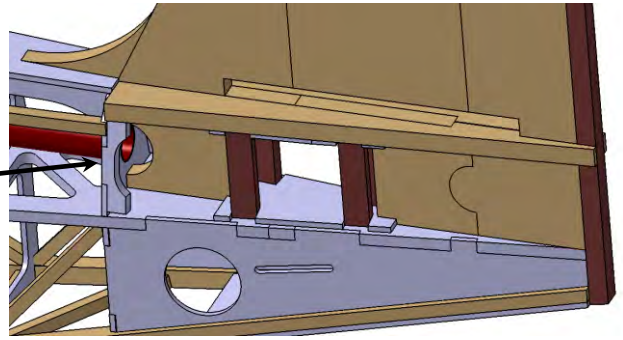
1-Glue rudder fin assembly as shown.
2-Measure assembly angle for perfect 90 degrees.
between horizontal plane and rudder fin.
3-Glue F20 as shown.
4-Cut (4) ¼ X ½ X 1 15/16 long hardwood sticks.
5-Glue hardwood sticks in slots found in F20 and F21.
They will be used to support elevator servos.
6-Sand F26 face to make them parallel to fuselage side
7-Glue (1) F26 on each sides of F9B.





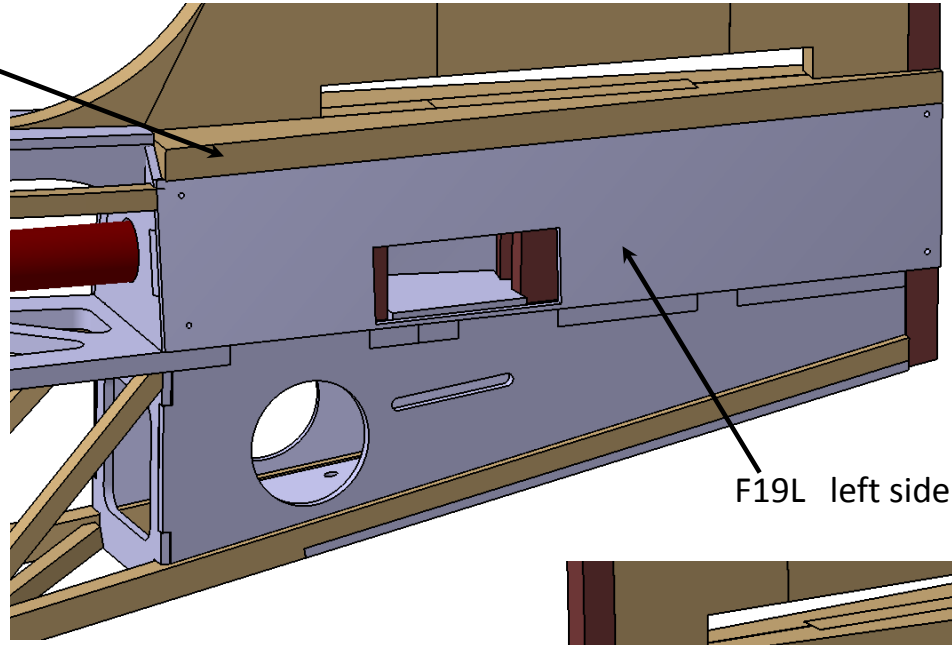


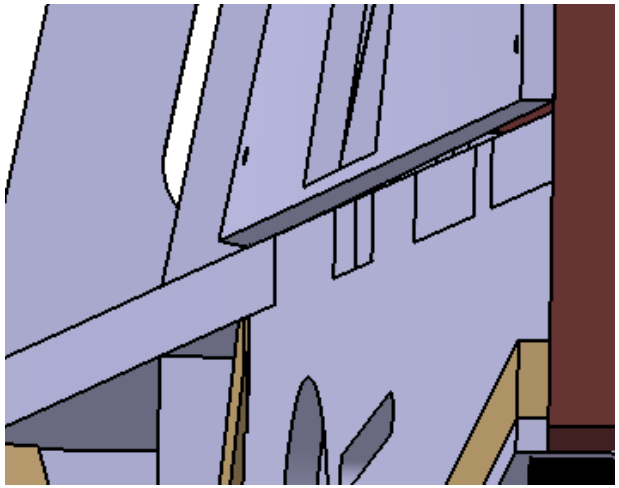


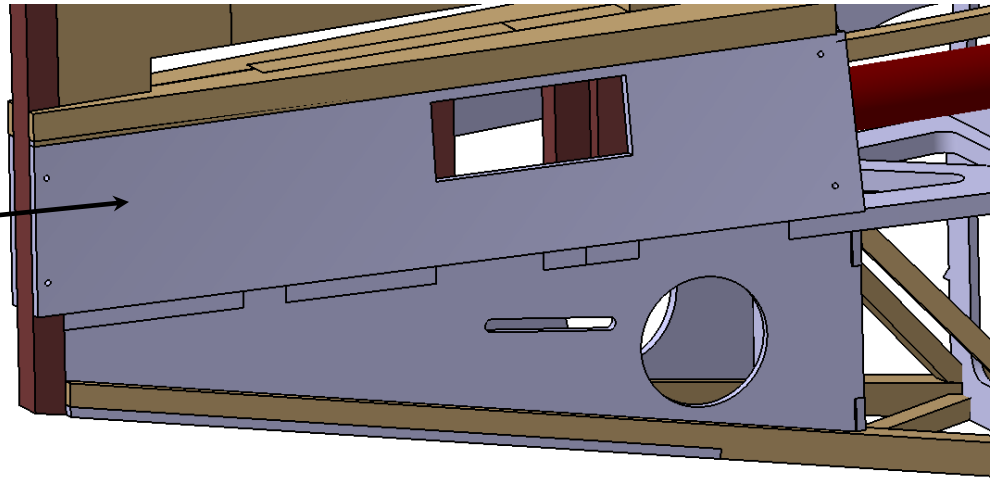


STEP34

1-F19L and F19R are kept in place using No2 x ½ screws
Use holes in F19L and F19R as guide to drill holes in rudder fin post and F26 parts located on each sides of F9B
5-Sand R1D flush to F19L and F19R

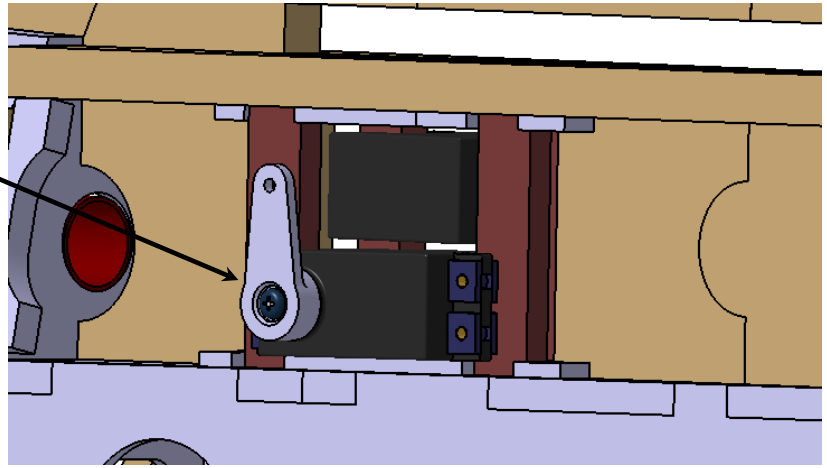




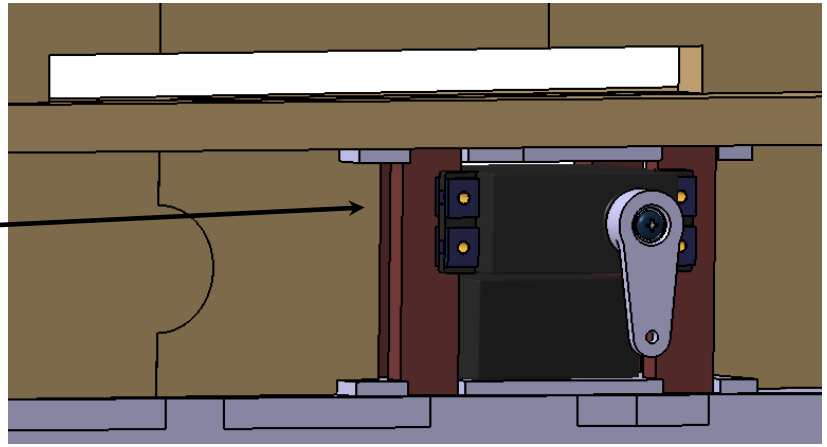


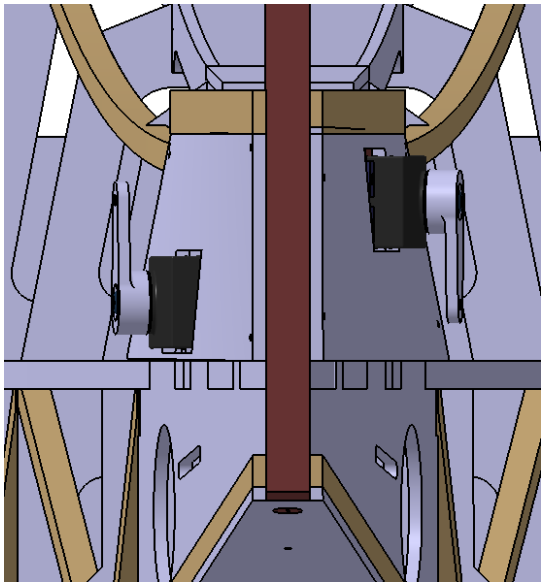
Elevator servos installation

left side servo



Right servo



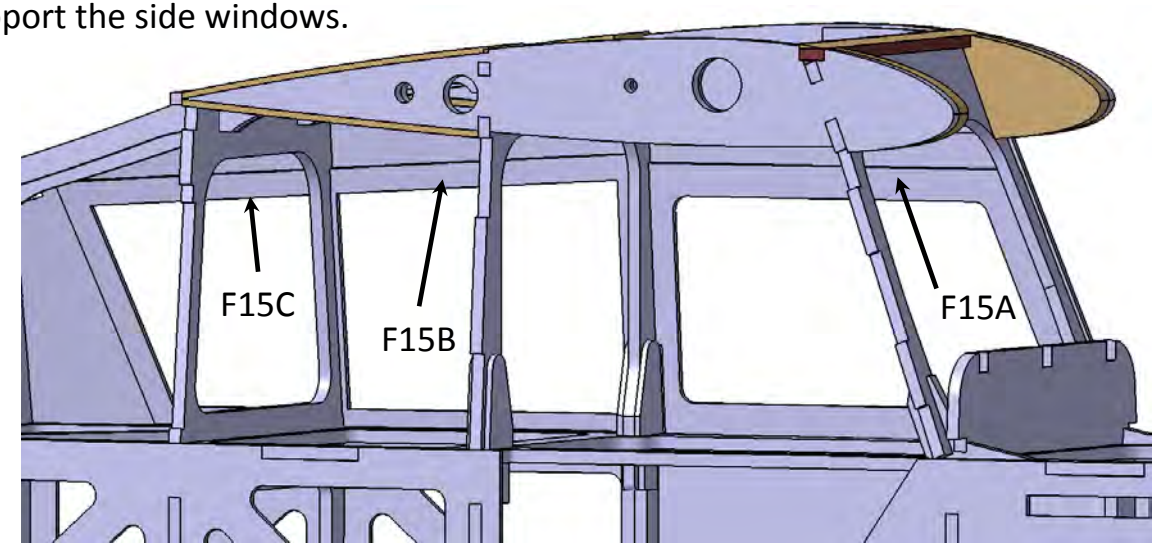


Elevator servos view from rear with F19L and F19R installed

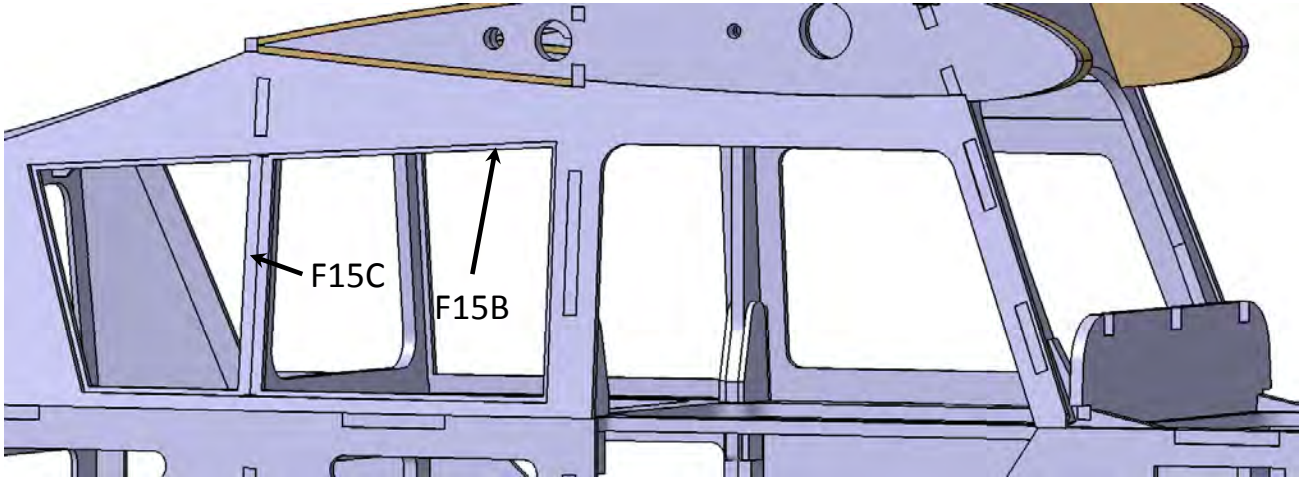
STEP35

1-Glue F15A, F15B and F15C inside F15 on both sides of fuselage.
Right side parts not shown for clarity.
These parts will support the side windows.

Left side

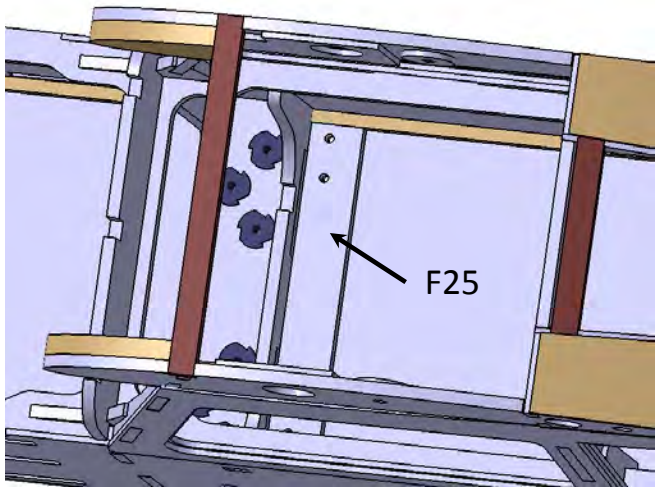


Right side

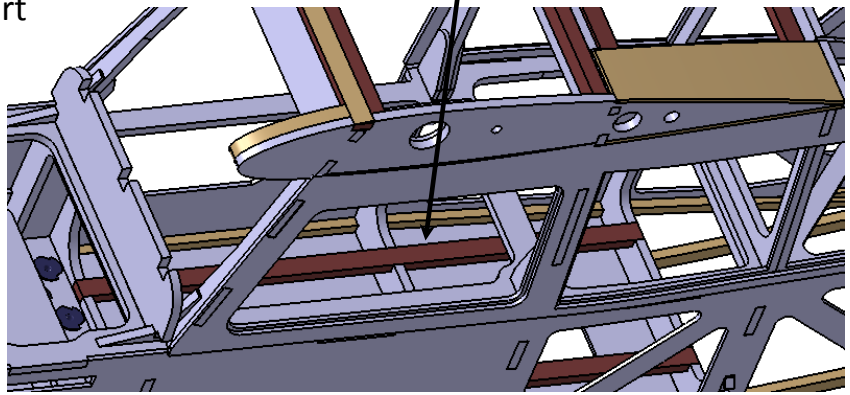


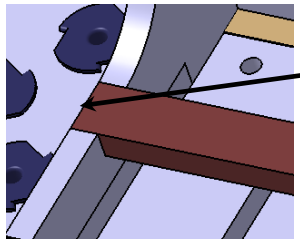
STEP36

1-Glue F25 over fuselage bottom as shown.
2-Cut (2) ¼ X ½ X 14 5/8 long hardwood sticks.
3-Glue the ¼ X ½ hardwood sticks between F3 and F5.
4-Install F27 rudder servo support and F28 fuel tank support using No2 X ½ wood screws.

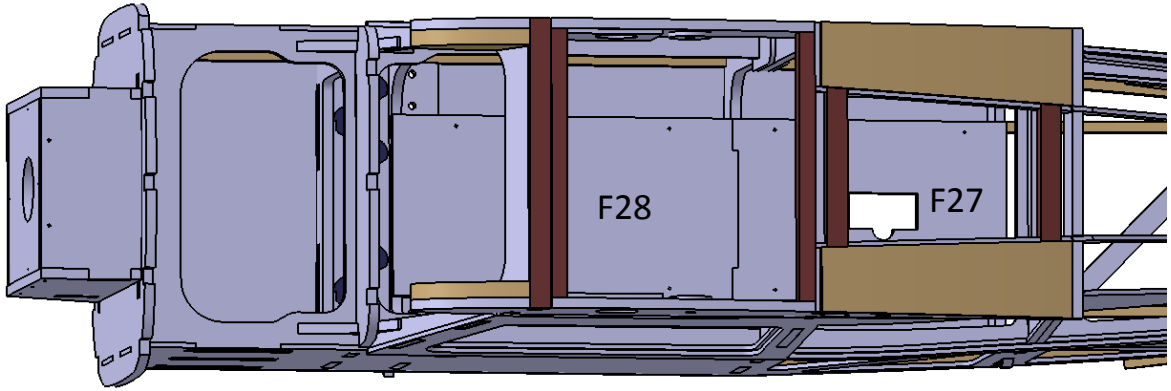


¼ X ½ hardwood sticks (2 required)



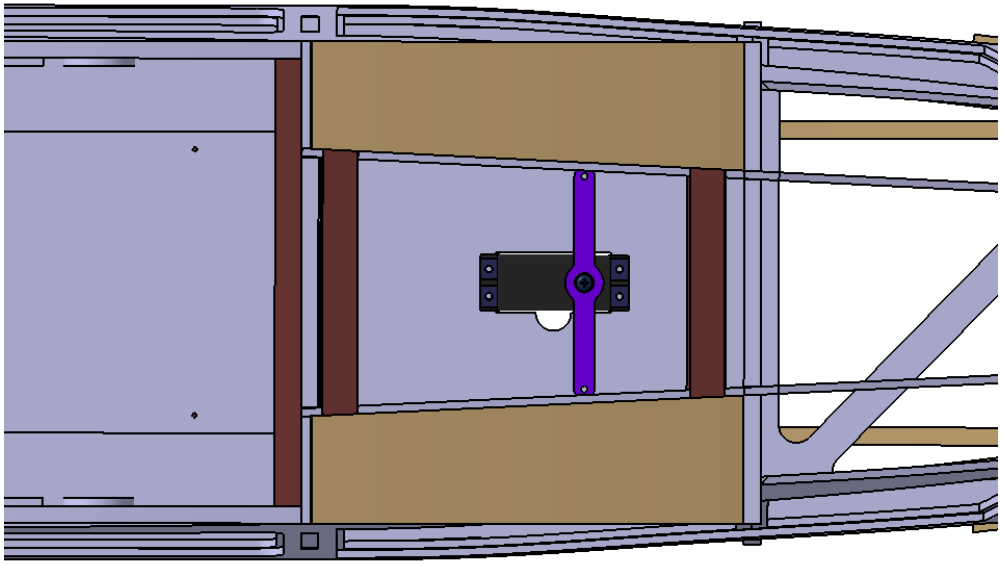


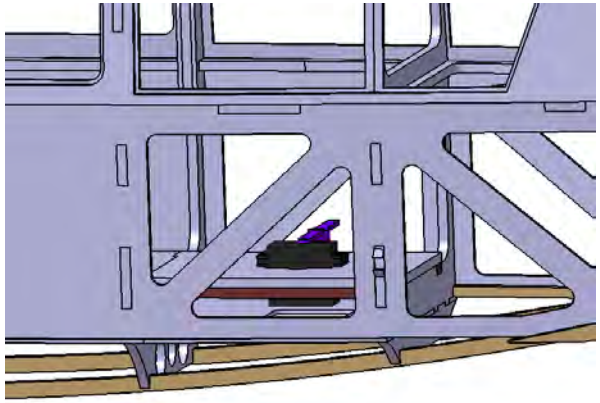
¼ X ½ hardwood sticks front end Flush with F3



Rudder servo installation

1-Glue F25 over fuselage bottom as shown.
2-Cut (2) ¼ X ½ X 14 5/8 long hardwood sticks.
3-Glue the ¼ X ½ hardwood sticks between F3 and F5.
4-Install F27 rudder servo support and F28 fuel tank support using No2 X ½ wood screws.

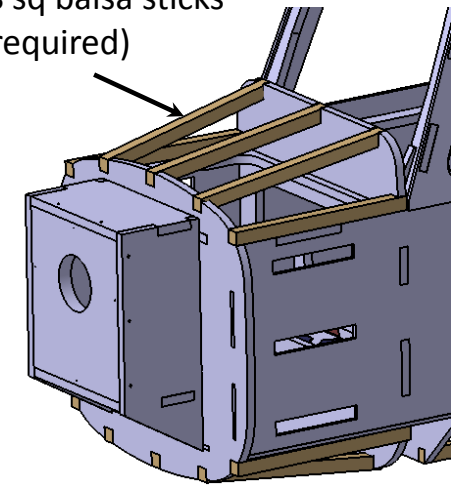


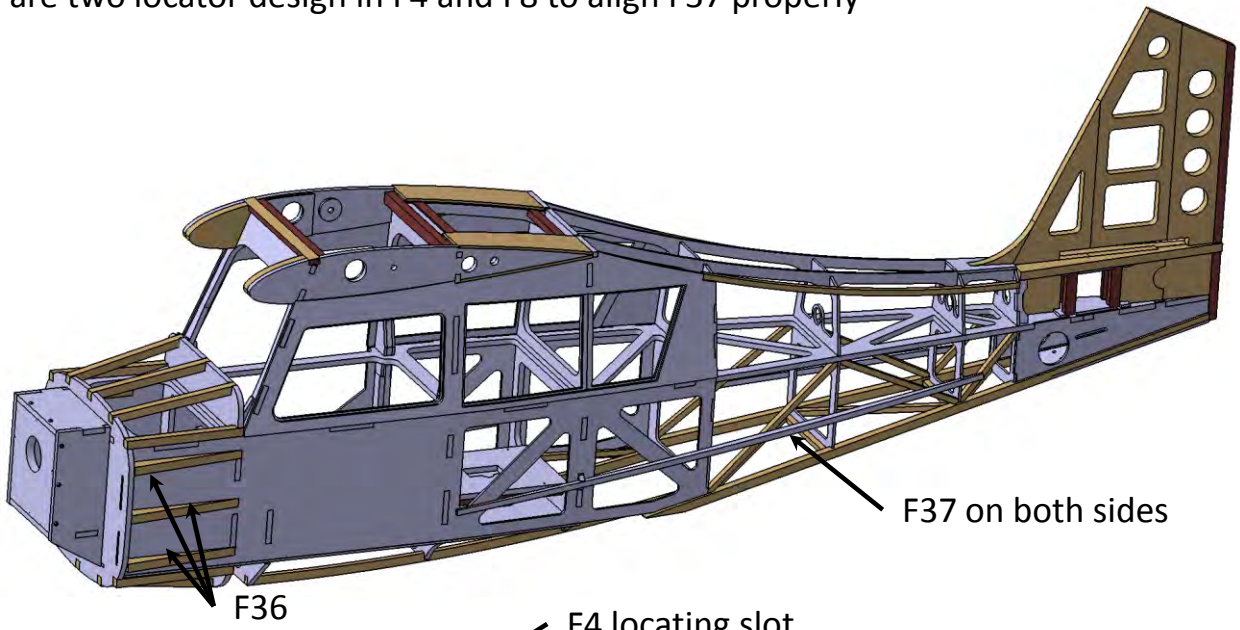


STEP37

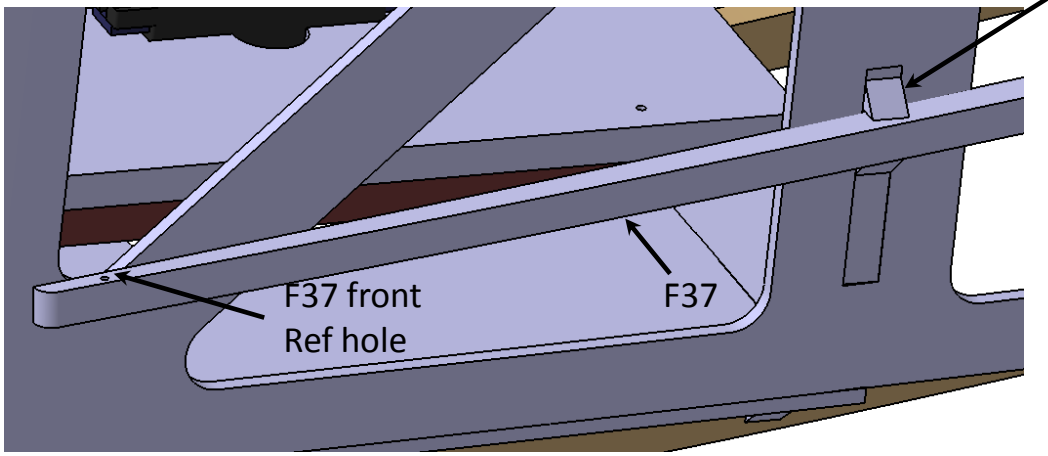
1-Glue (5) 3/8 sq balsa stick between F1 and F2D.
2-Glue (6) F36 on each sides of fuselage. They locate in large slots in FS
3-Glue (1) F37 on each sides of fuselage as shown.
Hole in F37 indicate the front. There are two locator design in F4 and F8 to align F37 properly

3/8 sq balsa sticks
(5 required)

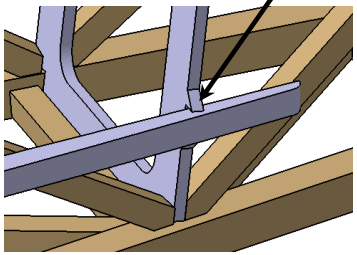




F4 locating slot

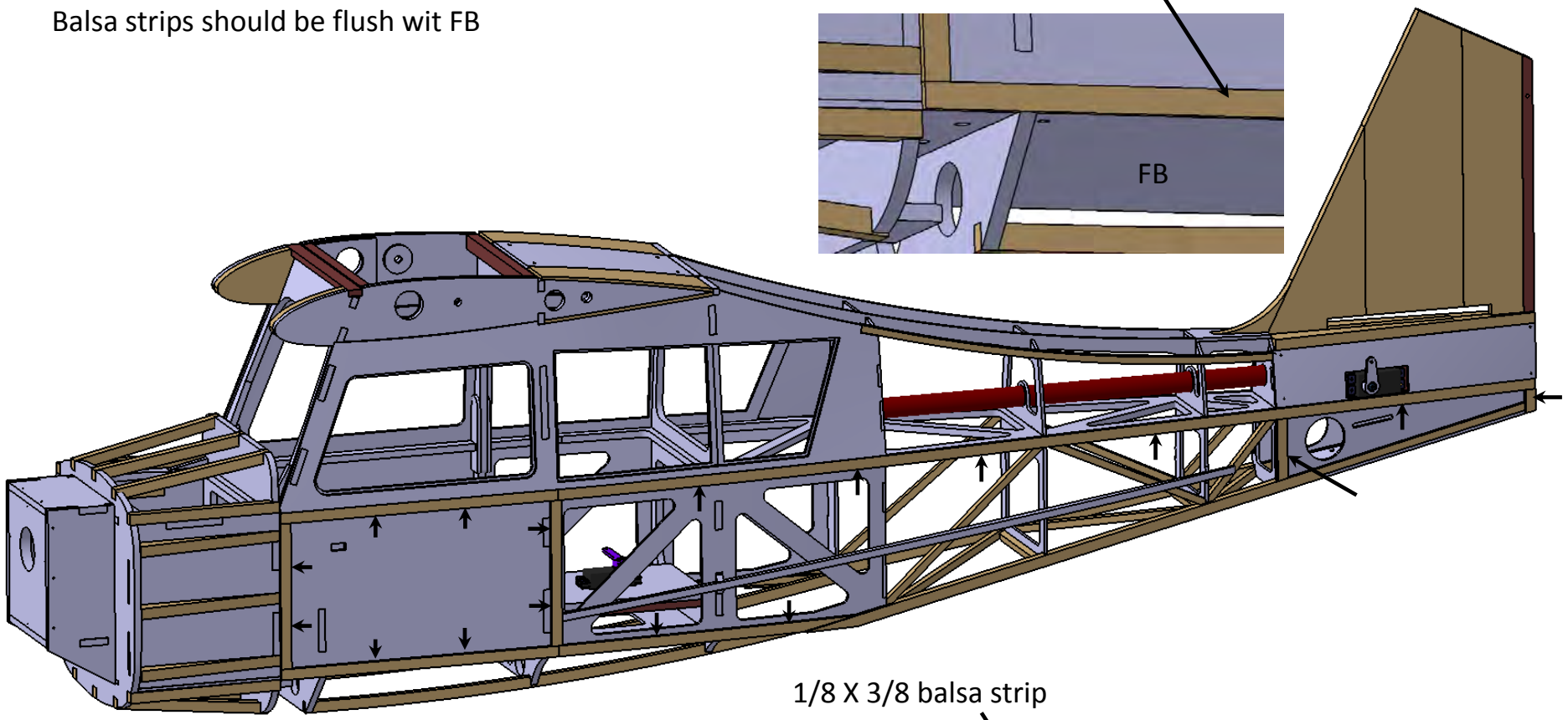


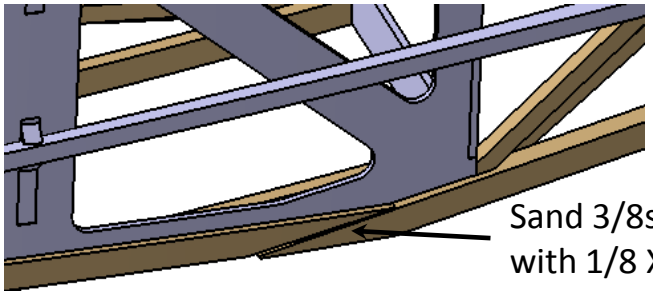
F8 locating slot

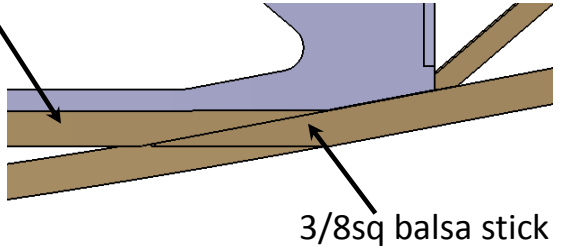


STEP38a

1-Cut strips of 1/8 X 3/8 x36 inches long balsa sheeting.
2-Glue pieces of balsa strips as indicated by arrows.
Balsa strips should be flush wit FB

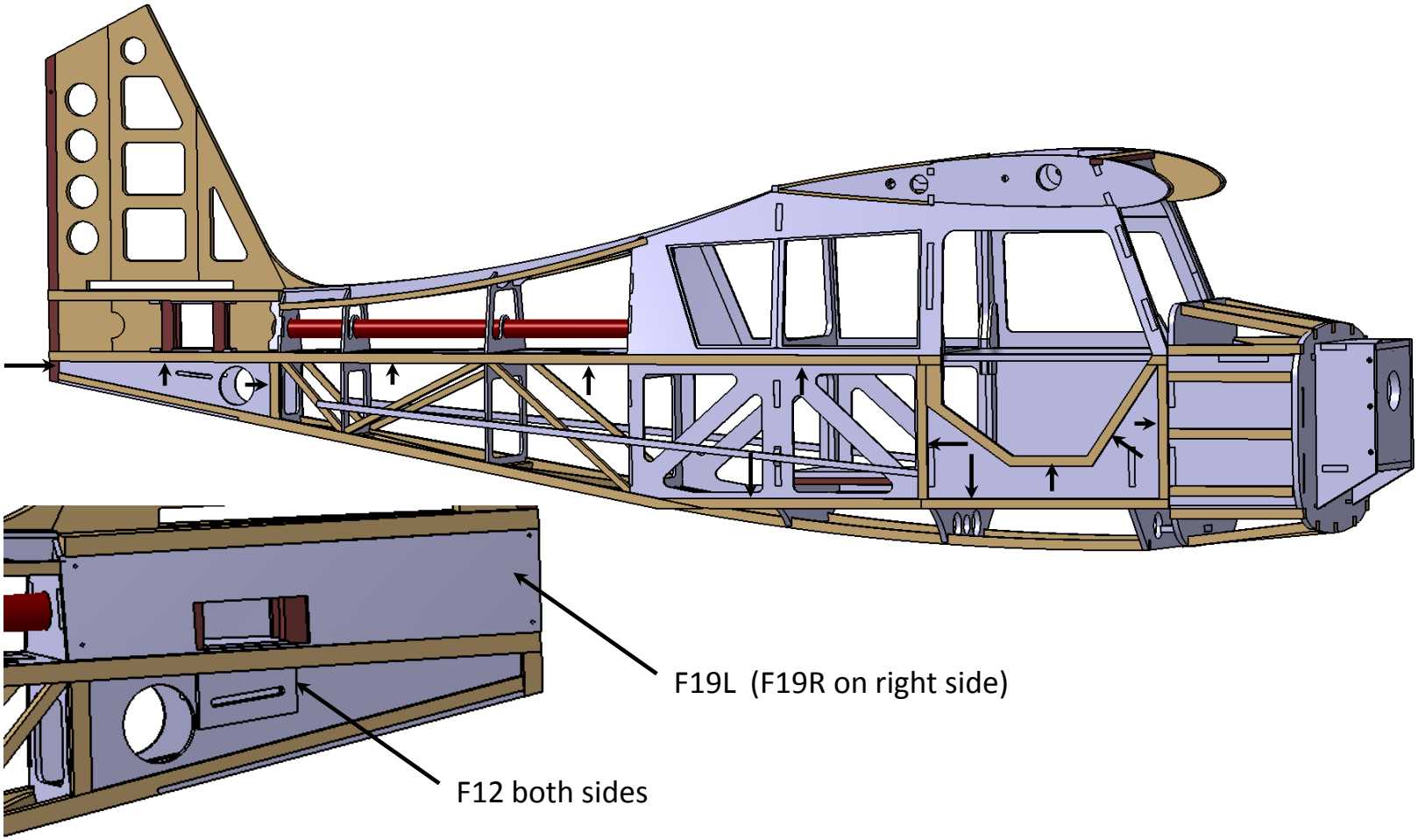






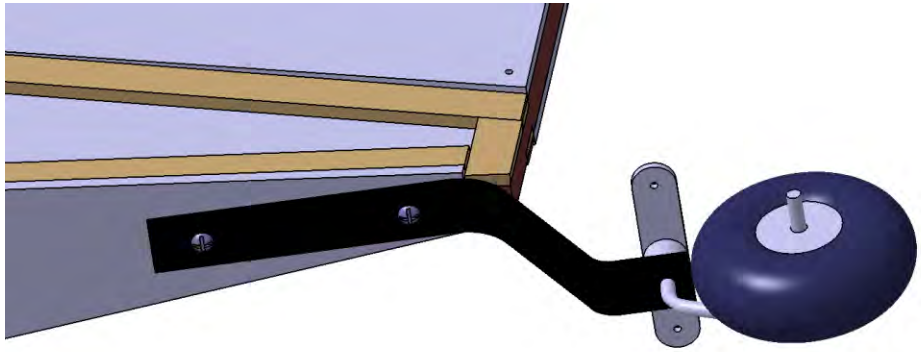
STEP38b

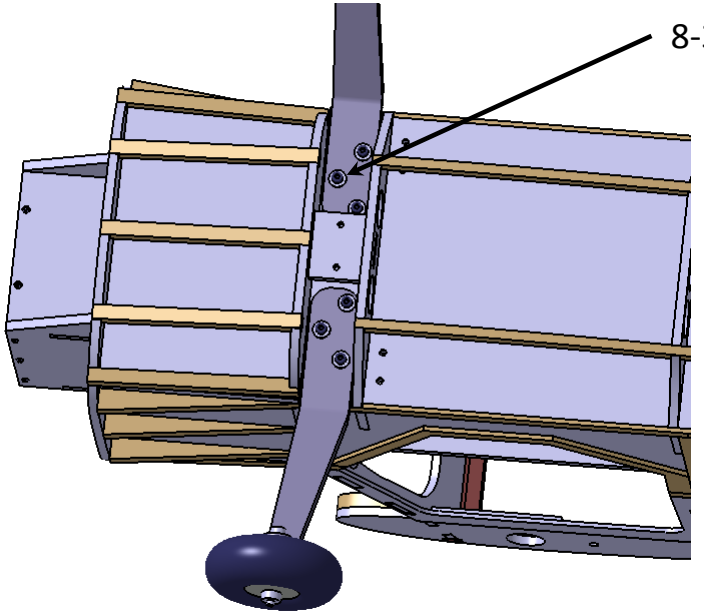
1-Cut strips of 1/8 X 3/8 x36 inches long balsa sheeting.
2-Glue pieces of balsa strips as indicated by arrows on right side as shown.
3-Glue (2) F12 as shown
4-using #4 X ½ long screws, install F19L and F19R.



STEP39

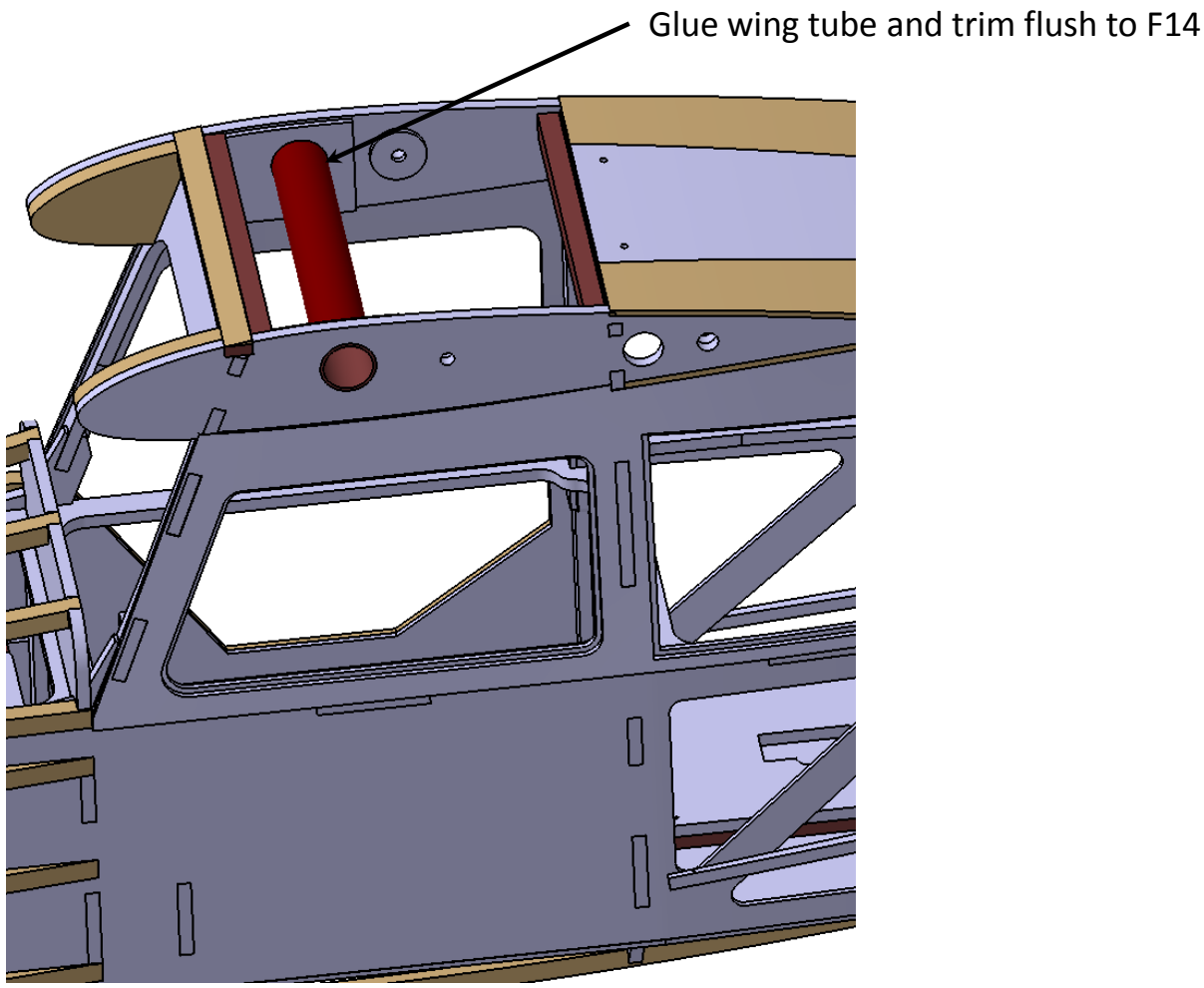
1-Install tail wheel as shown using screw provided with tail wheel
2-Install Landing gear using (6) 8-32 SHCS and (6) #8 washers
Use Locktite to secure main landing gear once the plane is finish





STEP40

1-Glue wing tube and trim flush to F14



STAB AND ELEVATOR ASSEMBLY

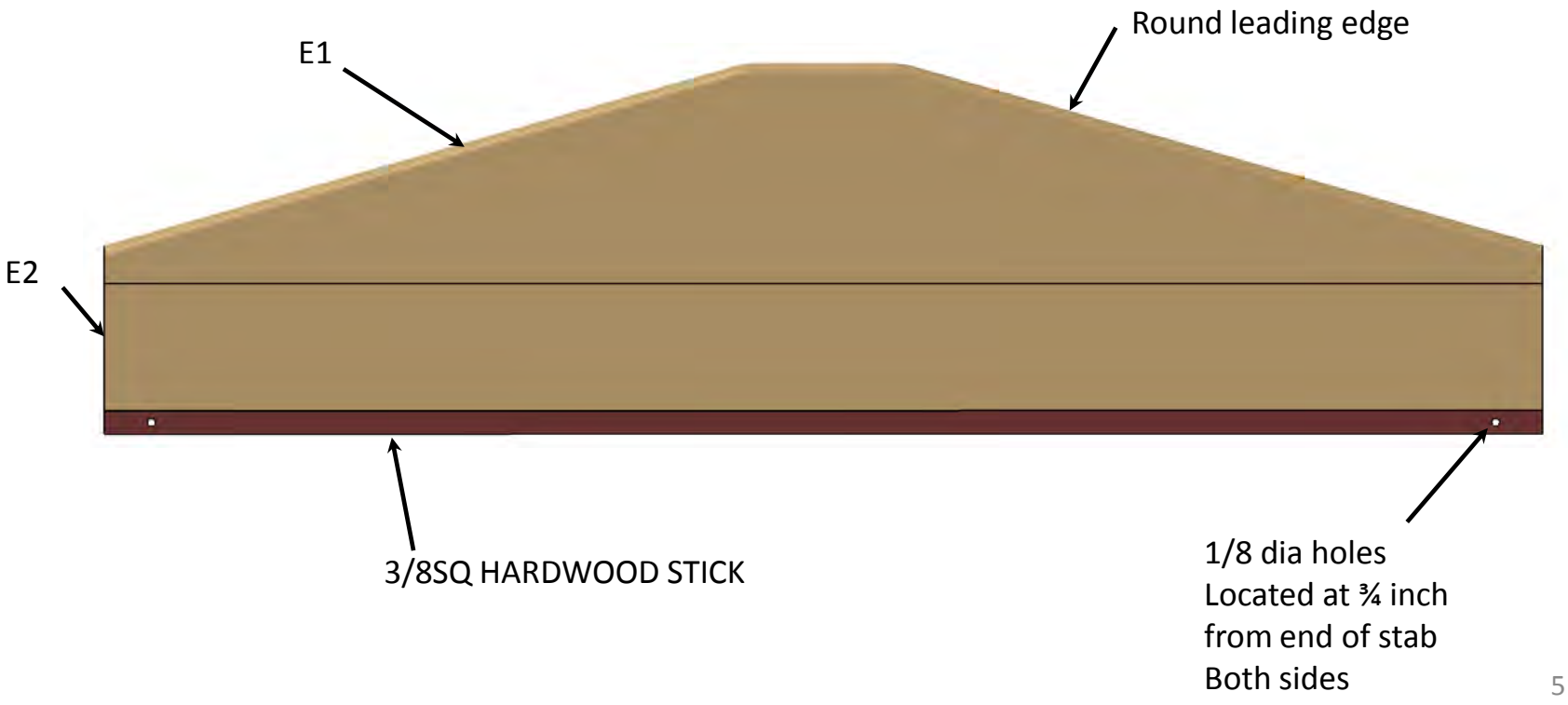
Follow directions carefully

Always dry fit first

Assemble all components on a flat building board

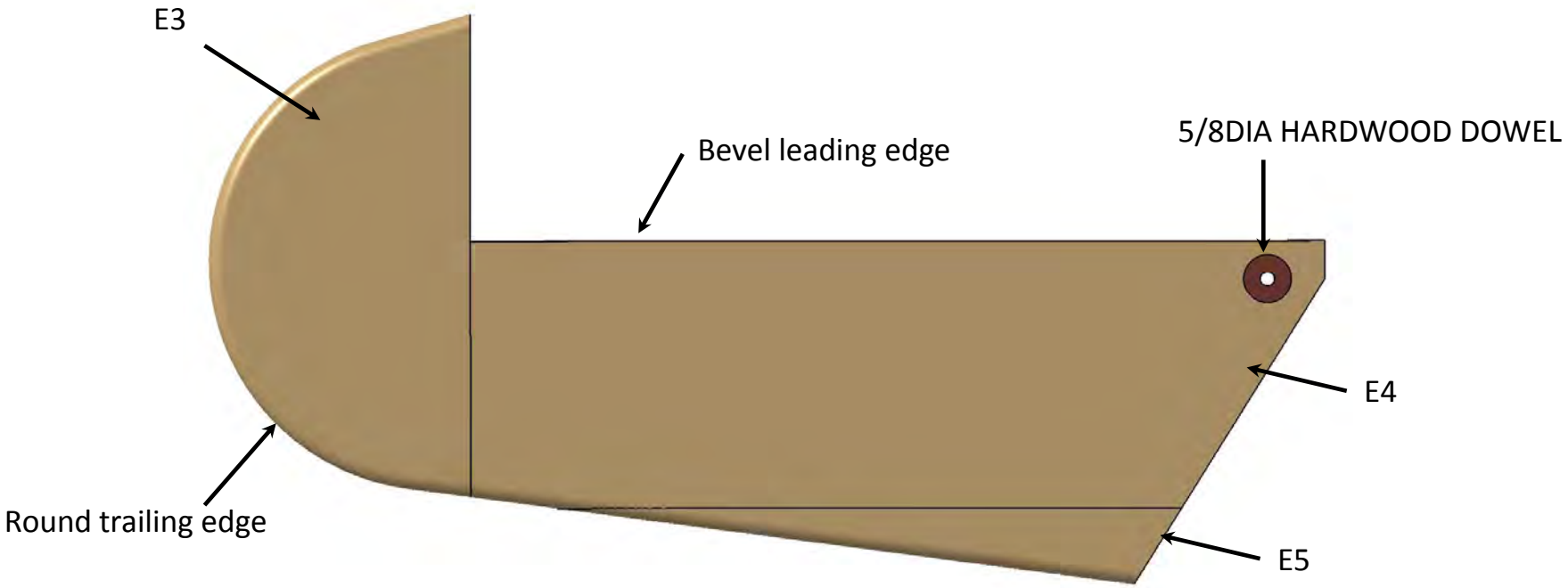
STAB ASSEMBLY STEP1

1-Glue E1 and E2 as shown.
2-Cut a 3/8sq hardwood stick 23 inches long
4-Glue a 3/8 sq hardwood stick and trim both end
5-Round leading edge.
6-Align with the fin and mark location of Robart hinges (5 required)
7-Drill 3/16 dia holes using Robart drill jig on both fin and rudder



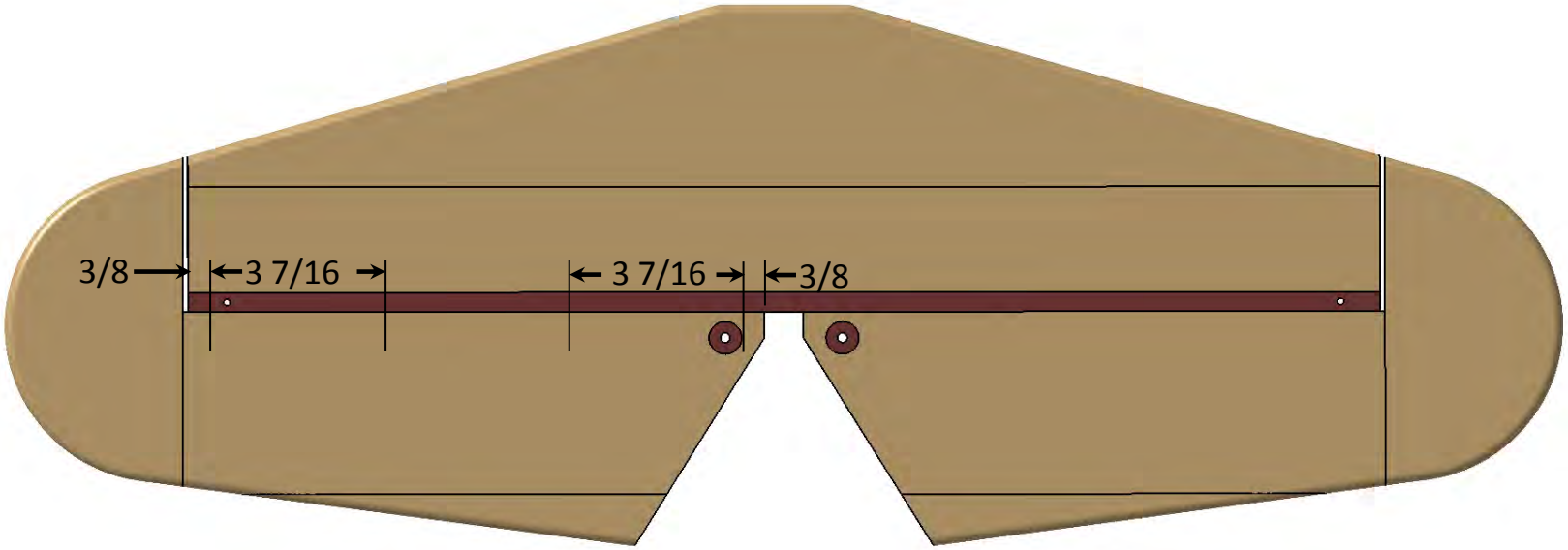
ELEVATOR ASSEMBLY STEP2

1-Glue E1 and E2 as shown.
2-Cut a 3/8sq hardwood stick 23 inches long
3-Glue a 3/8 sq hardwood stick and trim both end
4-Round leading edge.
5-Drill 2 holes 1/8 dia located at ¾ inch from end of hardwood stick



STAB AND ELEVATOR ASSEMBLY STEP3

1-Mark lines on both stab and elevators to align Robart hinges as shown.
2-Drill 3/16 dia holes using Robart drill jig on both fin and rudder



STAB INSTALLATION

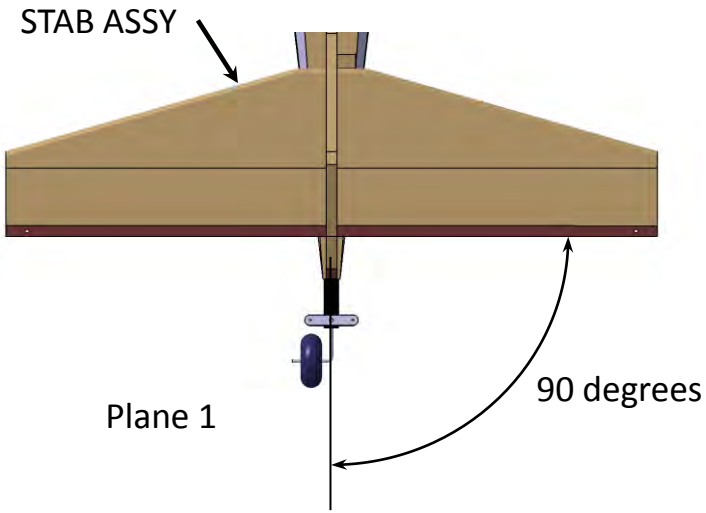
Follow directions carefully

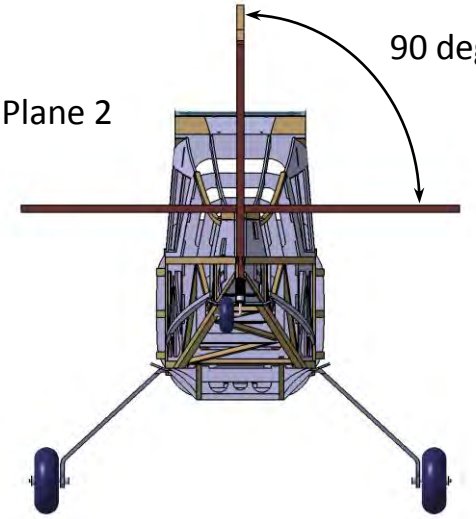
Always dry fit first

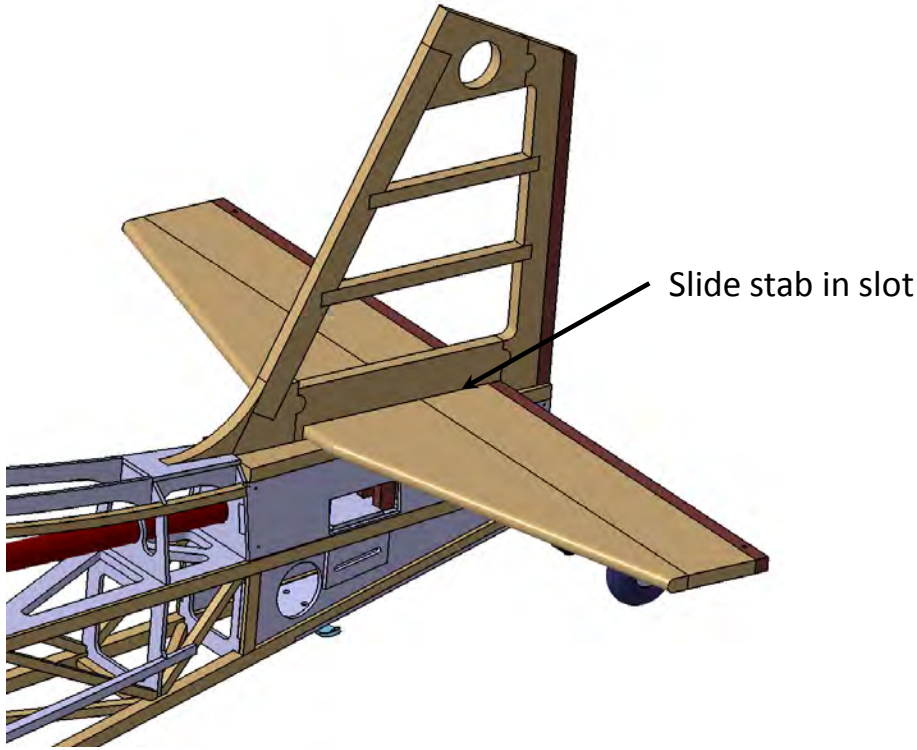
Assemble all components on a flat building board

STAB INSTALLATION STEP1

1-Slide stab into slot found in rudder fin
2-Slightly lift on side of the stab to insert glue under on both side
3-Align carefully in both planes and secure while glue is bonding





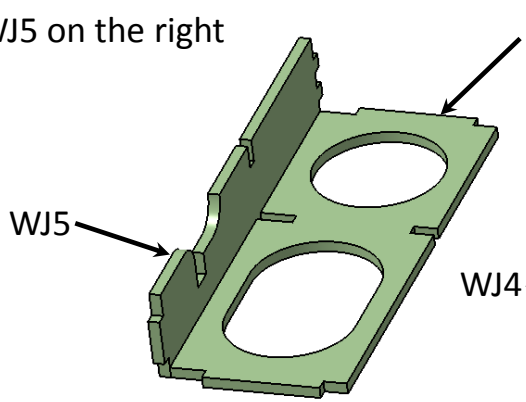


WING ASSEMBLY

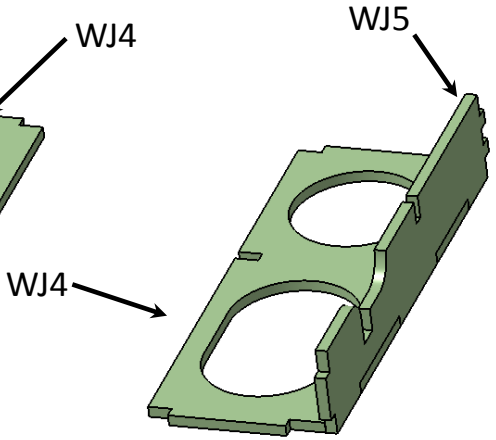
LEFT WING SHOWN IN INSTRUCTION
INVERT FOR RIGHT WING
Follow directions carefully
Always dry fit first
Assemble all components on a flat building board

WING ASSEMBLY STEP1

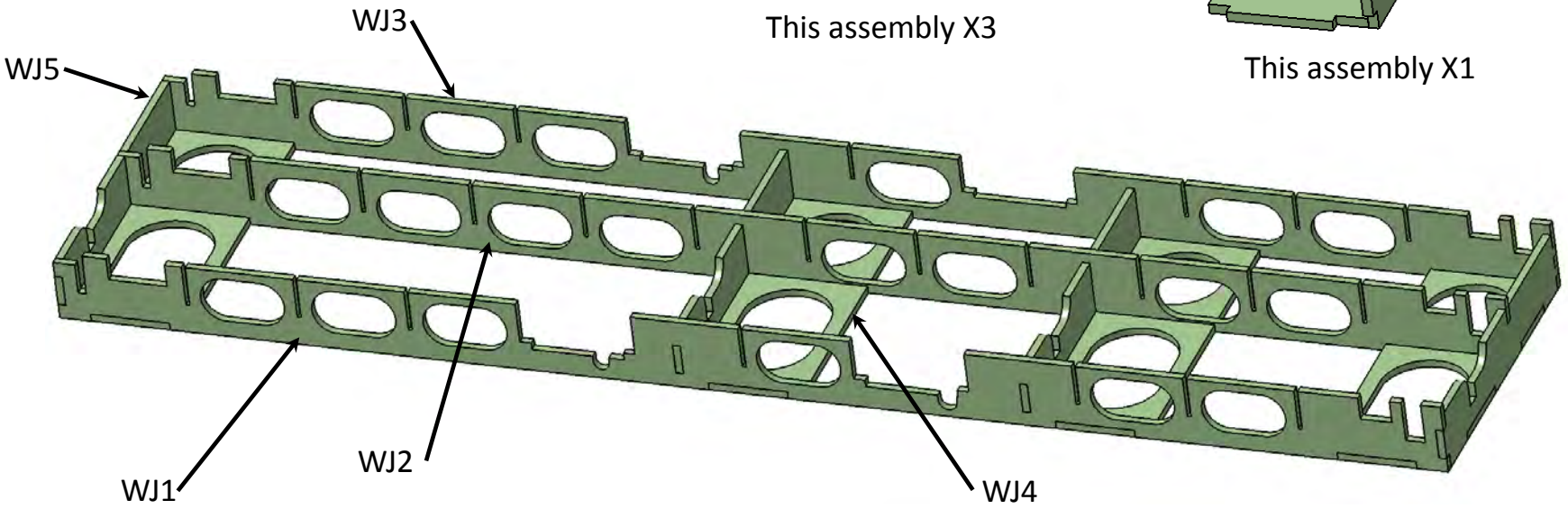
1-Assemble wing jig on a flat building surface
2-Assemble (3) set of WJ4 and WJ5 with WJ5 on the left
3-Assemble (1) Assembly of WJ4 and WJ5 with WJ5 on the right
4-Install WJ1 and WJ3 as shown
5-Slide WJ2 in the center slots as shown
6-Align jig with a straight edge
And fix it to table using crews on WJ4
When is it properly squared an straight.



This assembly X3



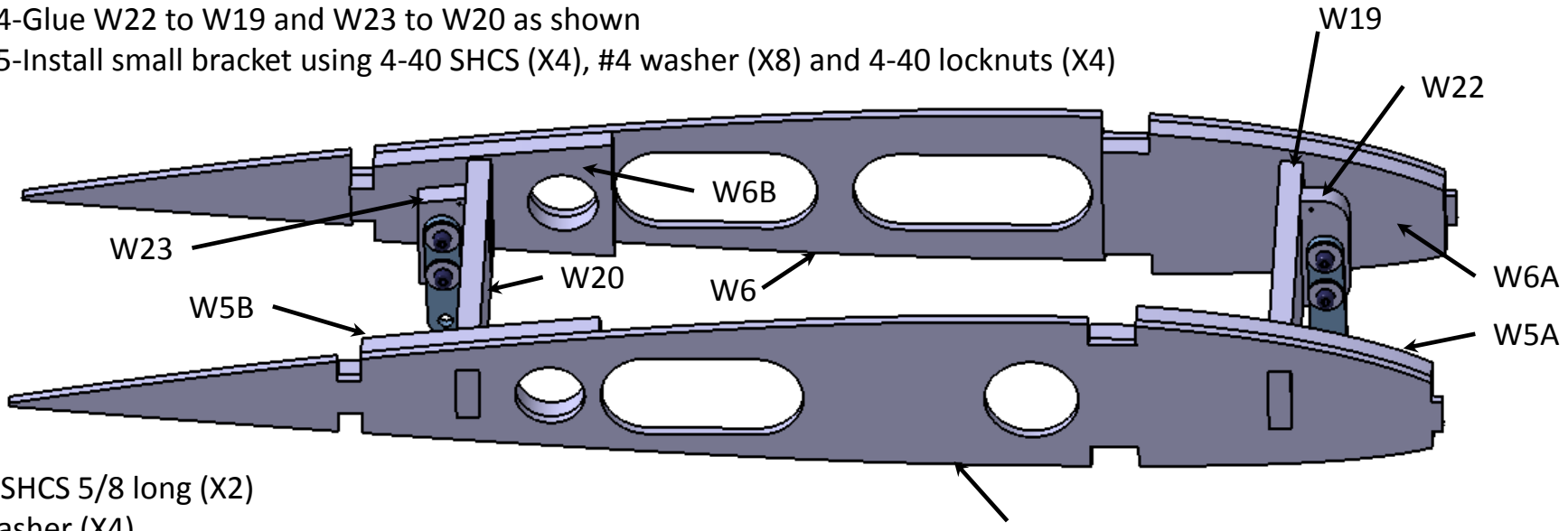
This assembly X1



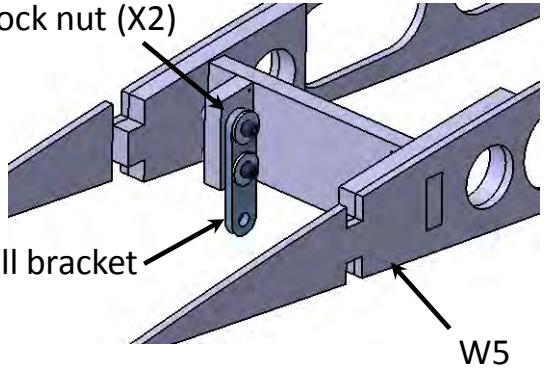
LEFT WING SHOWN

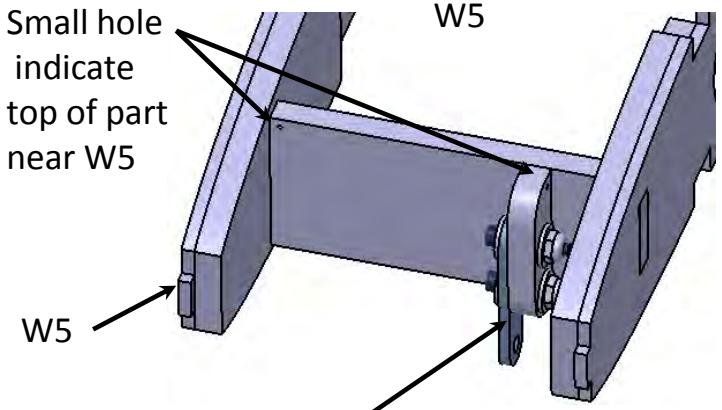
WING ASSEMBLY STEP2

1-Glue W5A and W5B on the outside of W5 rib as shown
2-Glue W6A and W6B on the inside of W6 rib as shown
3-Glue W19 and 20 between W5 and W6. Small hole in W22 and W23 indicate top and near W5
4-Glue W22 to W19 and W23 to W20 as shown
5-Install small bracket using 4-40 SHCS (X4), #4 washer (X8) and 4-40 locknuts (X4)



4-40 SHCS 5/8 long (X2)
#4 washer (X4)
4-40 lock nut (X2)



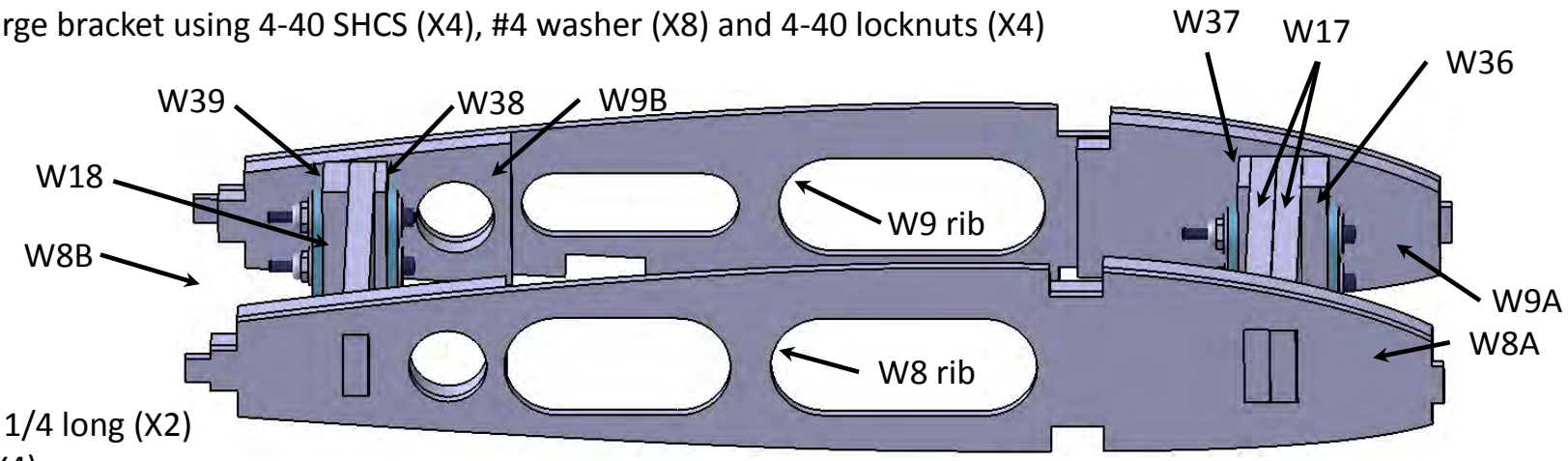


4-40 SHCS 5/8 long (X2)
#4 washer (X4)
4-40 lock nut (X2)

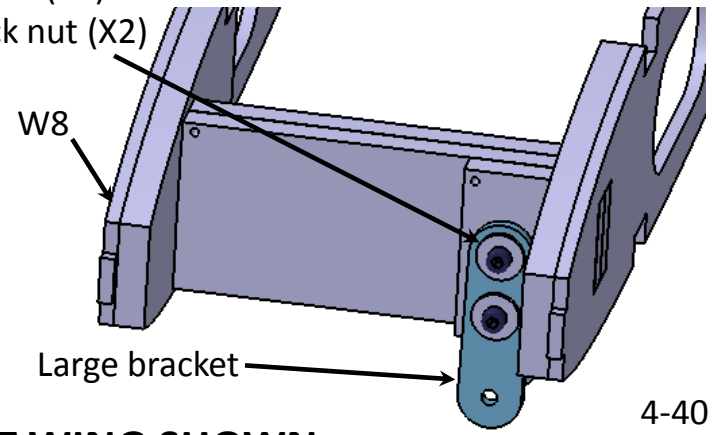
LEFT WING SHOWN

WING ASSEMBLY STEP3

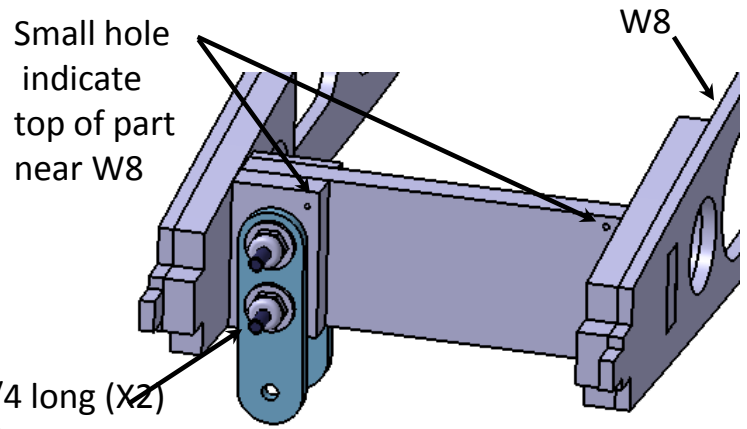
1-Glue W8A and W8B on the outside of W8 rib as shown
2-Glue W9A and W9B on the inside of W9 rib as shown
3-Glue (2) W17 together. Align holes carefully
4-Glue W18 (X1) and W17 (X2) between W8 and W9. Small hole in W17 and W18 indicate top and near W8
5-Glue W36 in front of W17 and W37 on rear of W17
6-Glue W38 in front of W18 and W39 on rear of W18
7-Install large bracket using 4-40 SHCS (X4), #4 washer (X8) and 4-40 locknuts (X4)



4-40 SHCS 1 1/4 long (X2)
#4 washer (X4)
4-40 lock nut (X2)



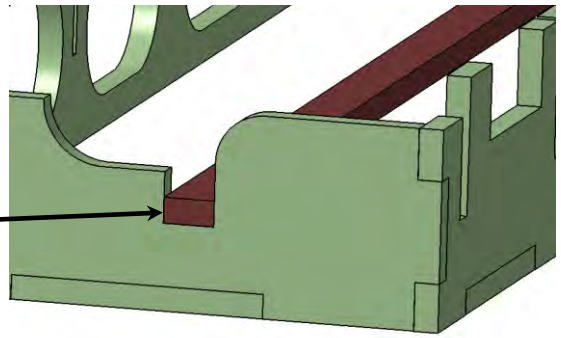
LEFT WING SHOWN

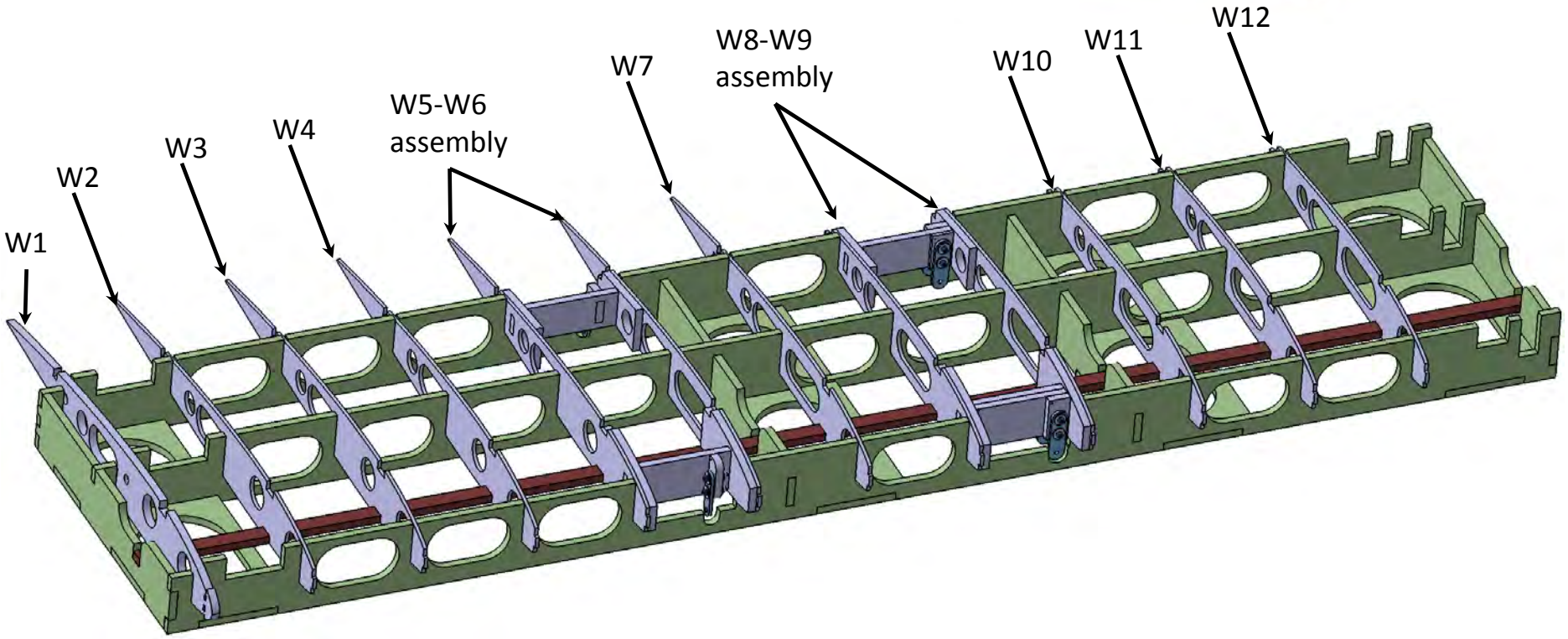


4-40 SHCS 1 1/4 long (X2)
#4 washer (X4)
4-40 lock nut (X2)

WING ASSEMBLY STEP4

1-Cut (4) ½ x ¼ hardwood stick to 44 inches long
2-Locate (1) ¼ x ½ bottom main spar on slot found on WJ5
2-Glue ribs W1 up to W12 over bottom main spar as shown
2-Glue W9A and W9B on the inside of W9 rib as shown

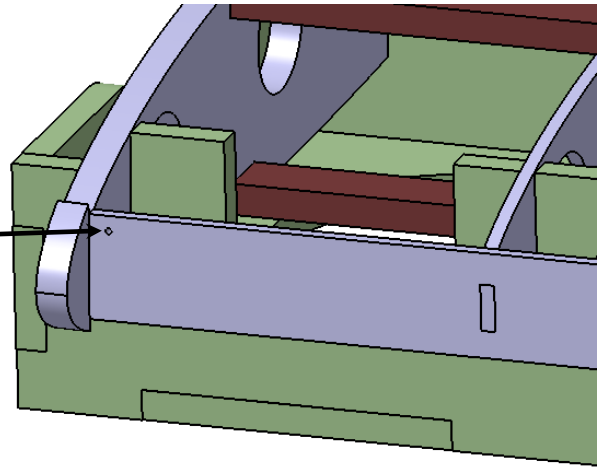


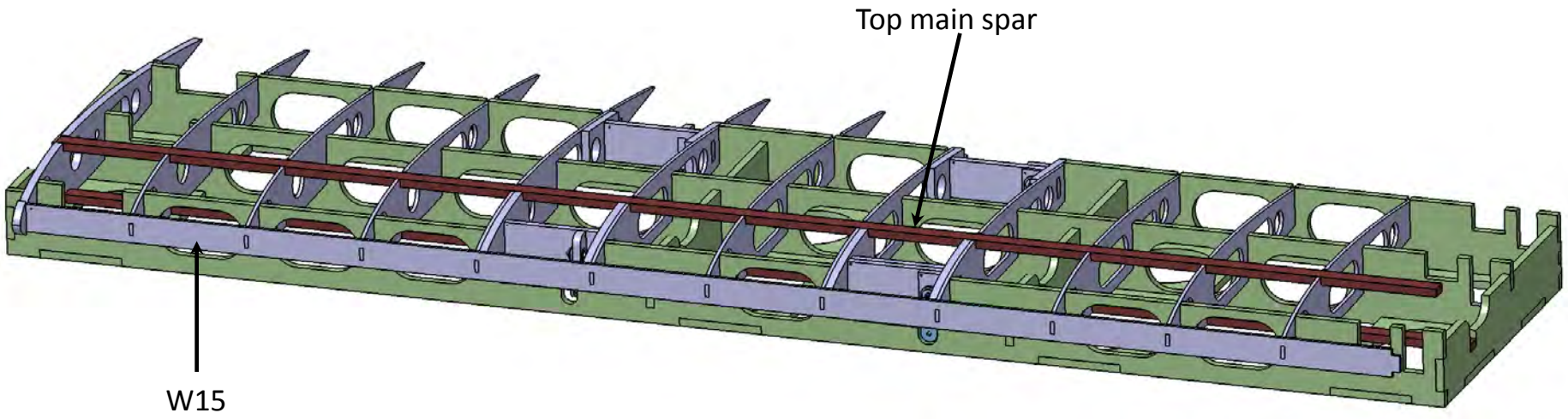


LEFT WING SHOWN

WING ASSEMBLY STEP5

1-Glue top main spar over ribs
2-Glue W15 on front of ribs as shown.
Notice small hole in W15 indicate top and near W1

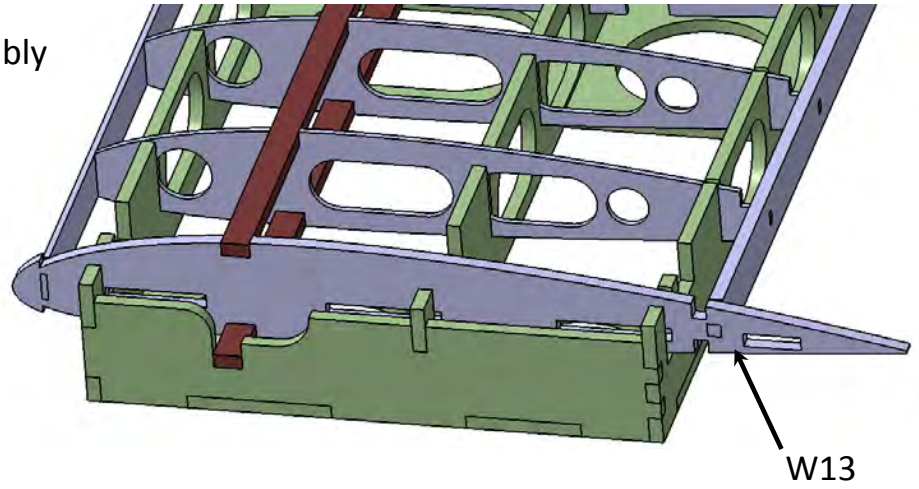


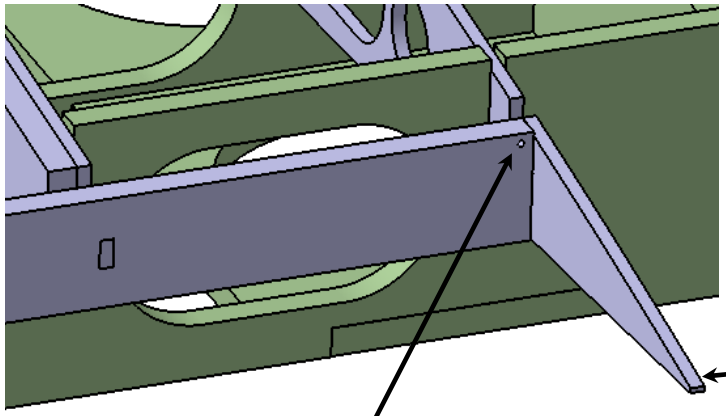


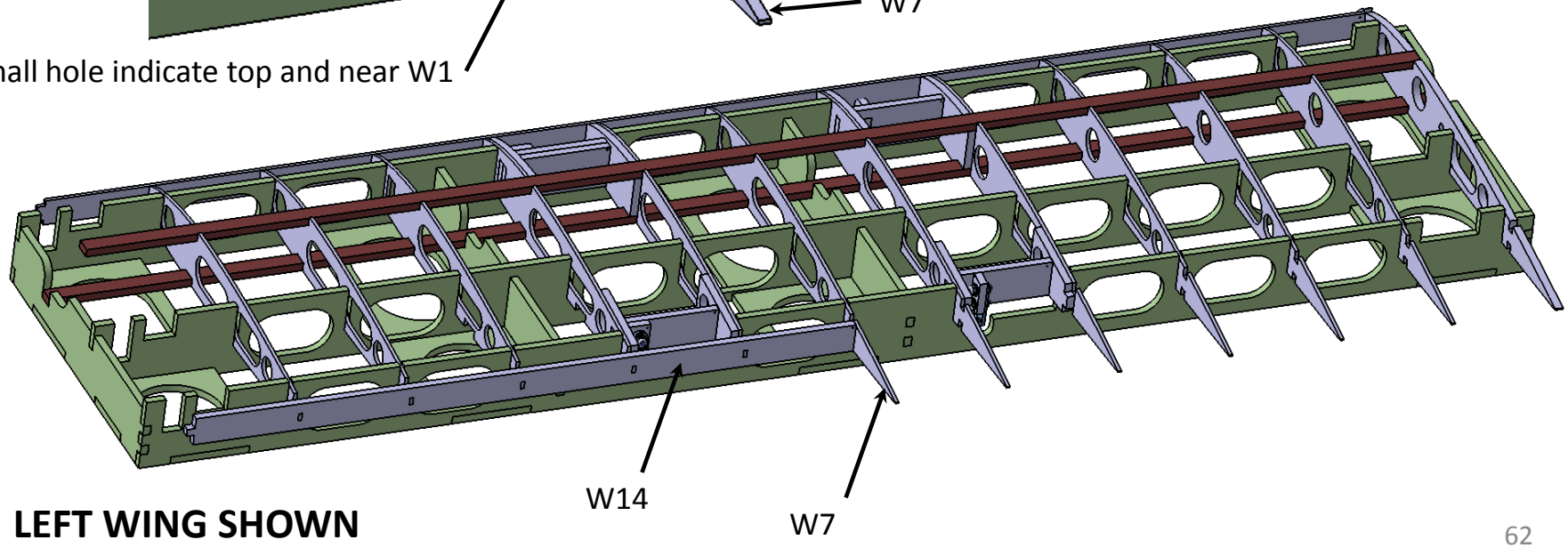
LEFT WING SHOWN

WING ASSEMBLY STEP6

1-Glue W14 on rear of ribs as shown.
Notice small hole in W14 indicate top and near W7
2-Trim main top spar to allow W13 to be slided in the assembly
3-Insert and glue W13 as shown



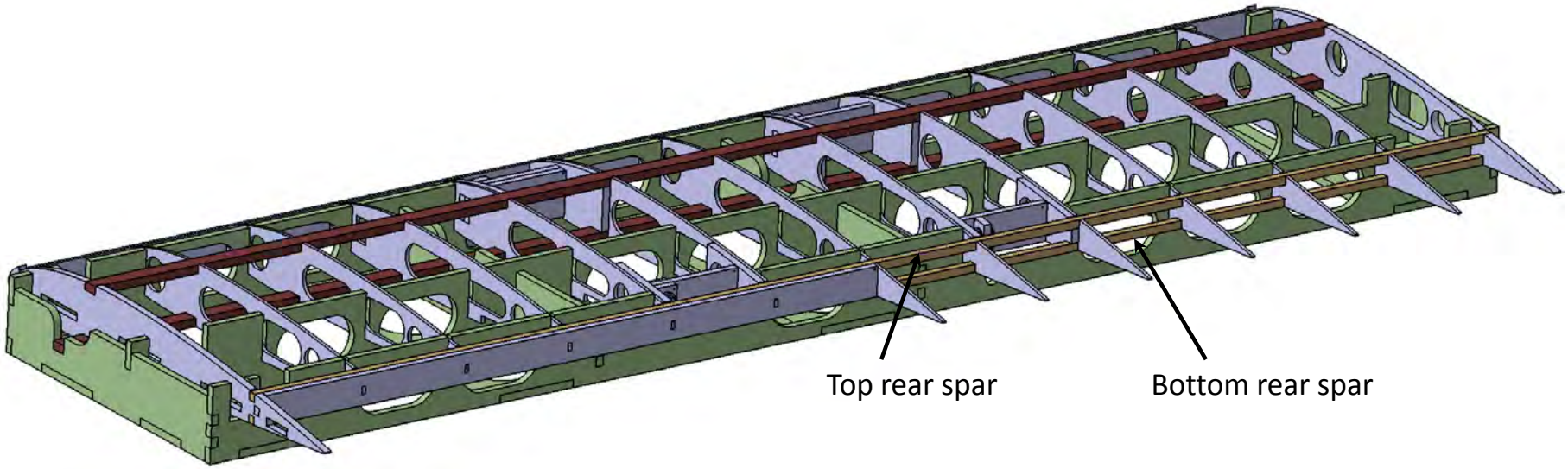


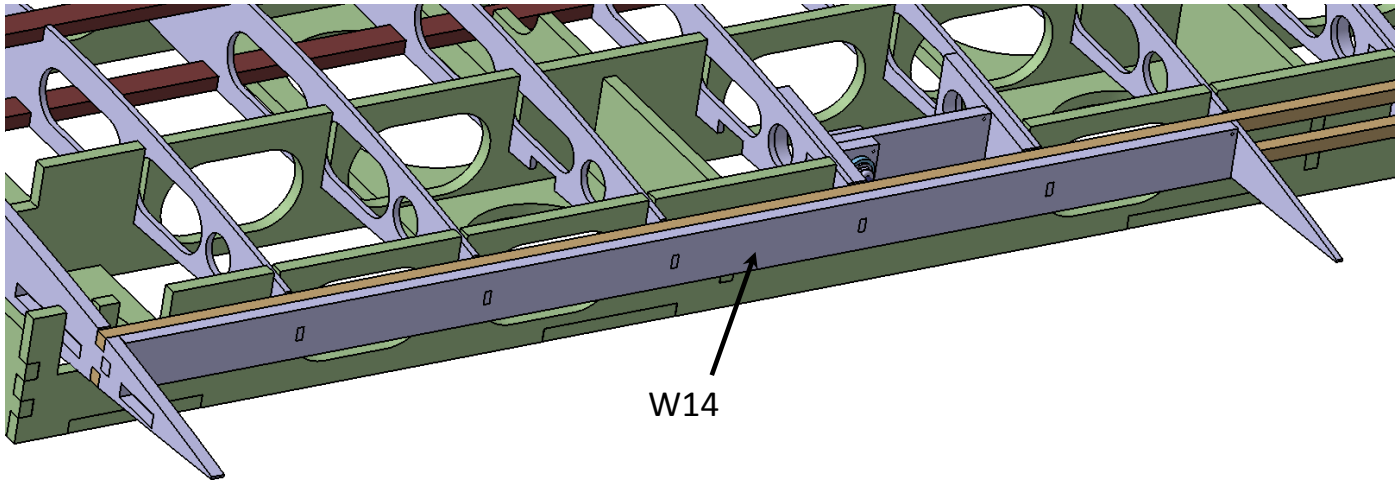


LEFT WING SHOWN

WING ASSEMBLY STEP7

1-Glue 1/4sq balsa rear spar on top and bottom of wing as shown.
It must be glued all along W14.

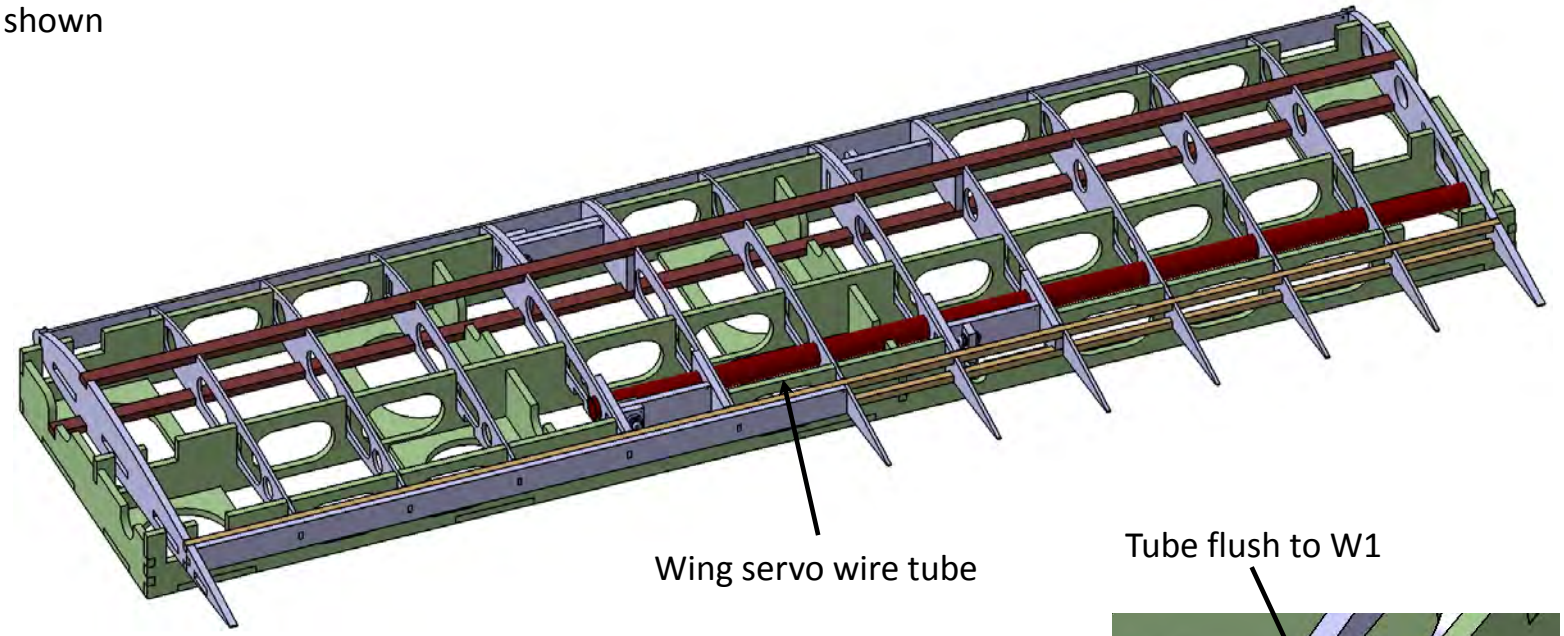


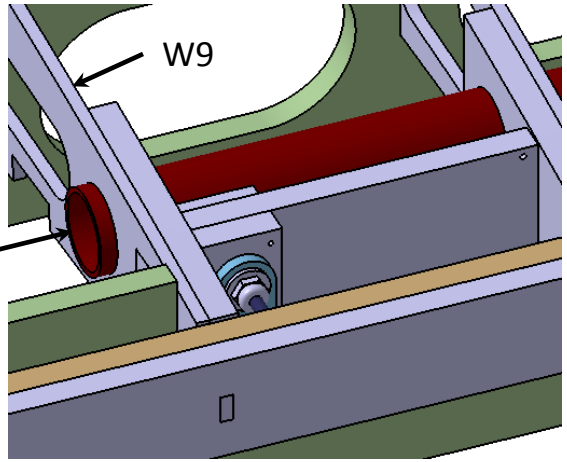


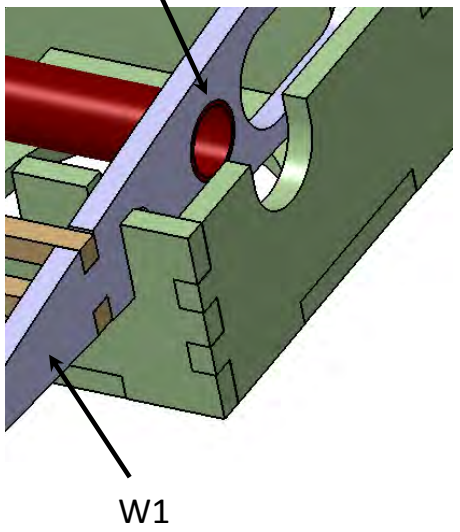
LEFT WING SHOWN

WING ASSEMBLY STEP8

1-Glue wing servo wire tube between W1 and W9
2-Trim as shown



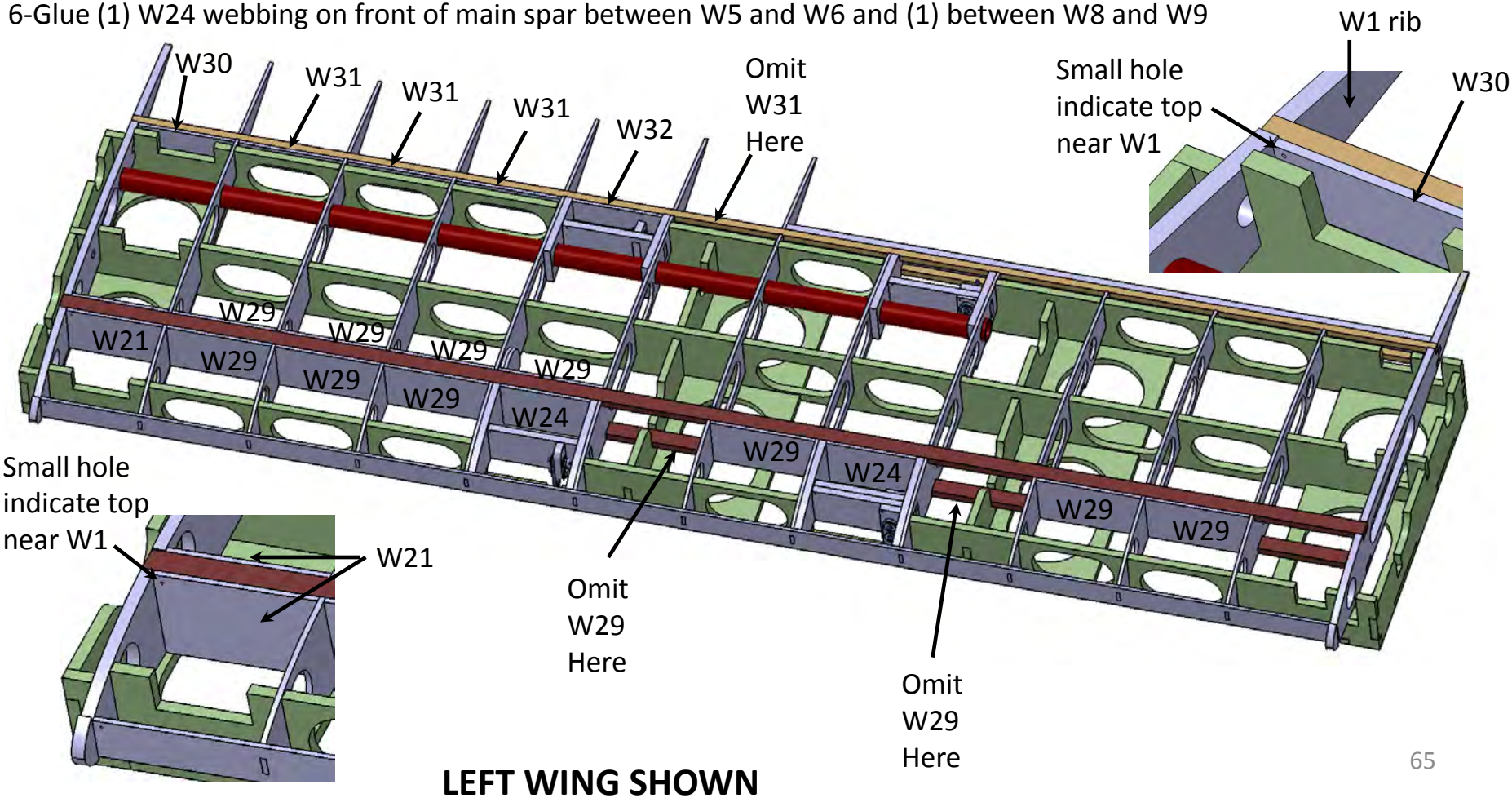




LEFT WING SHOWN

WING ASSEMBLY STEP9

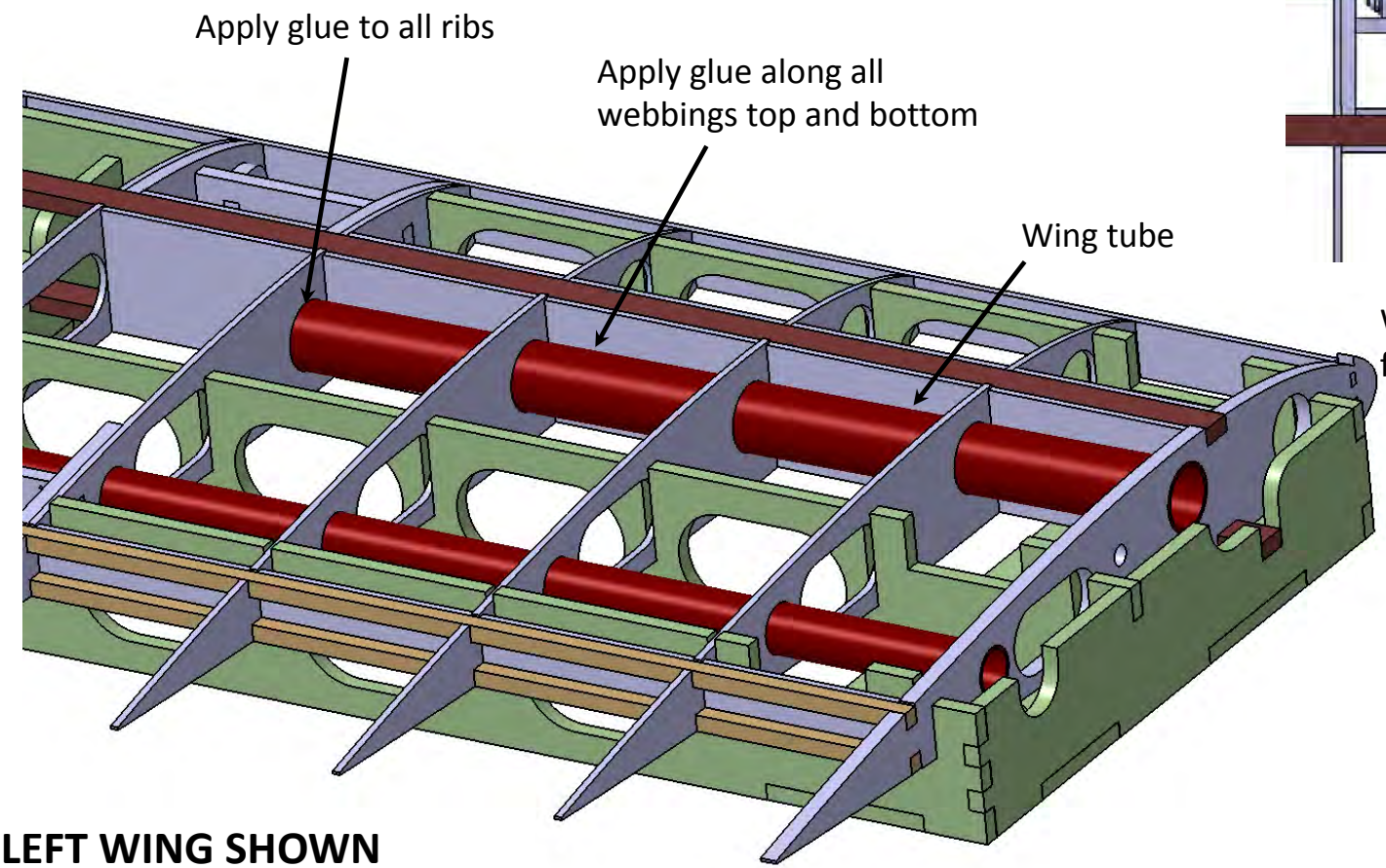
1-Glue (2) W21 webbing in front and rear of main spar between W1 and W2. Small hole in W21 indicate top and near W1
2-Glue (1) W30 webbing in front of rear spar between W1 and W2
3-Glue (3) W31 as shown. Omit W31 between W6 and W7
4-Glue (1) W32 between W5 and W6 and (1) between W8 and W9
5-Glue (10)W29 webbing at location shown. W29 in front and rear of main spar up to rib W6 and single webbing for the remaining ribs. Omit (1) W29 between W6 and W7 and (1) between W9 and W10
6-Glue (1) W24 webbing on front of main spar between W5 and W6 and (1) between W8 and W9

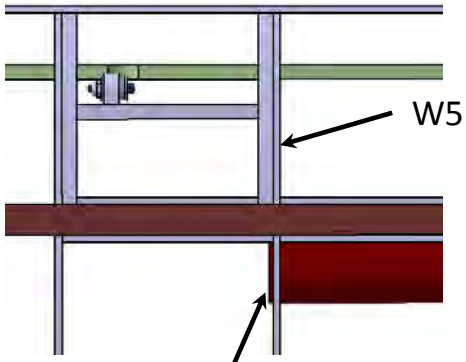


LEFT WING SHOWN

WING ASSEMBLY STEP10

1-Cut wing tube 14 ¼ inches long
2-Insert tube and apply glue to all ribs and webbing where the tube is .
Tube should ptotrude approximatively 1/16 from W5 rib
3-Trim tube flush to W1 rib

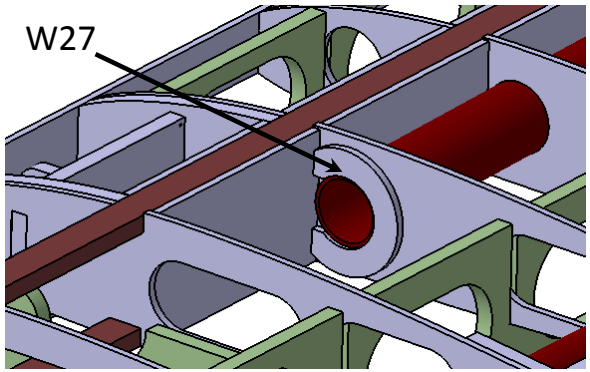


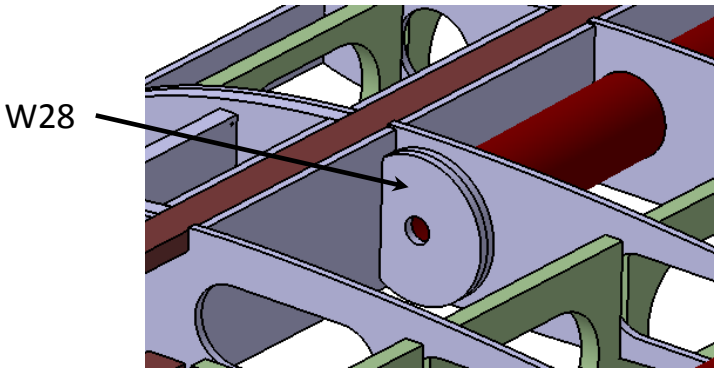


LEFT WING SHOWN

WING ASSEMBLY STEP11

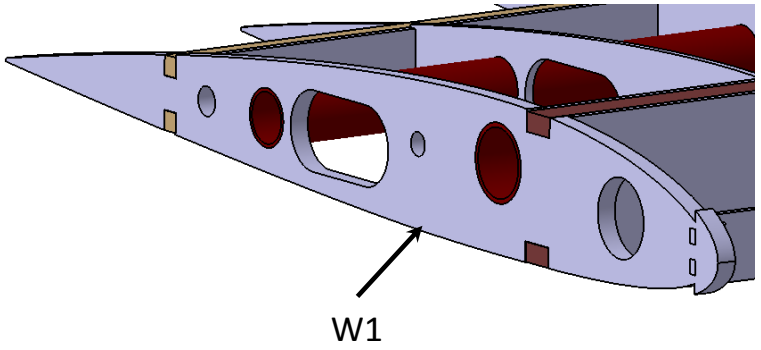
1-Glue W27 on outside of W5
2-Glue W28 on W27

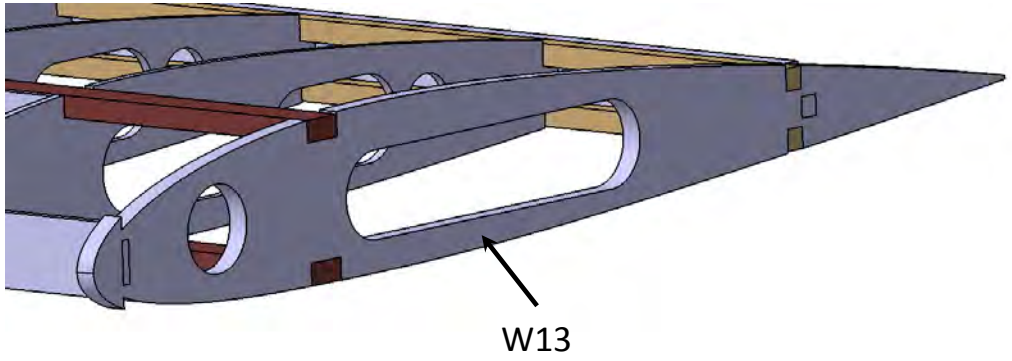




WING ASSEMBLY STEP12a

1-Remove wing from jig
2-Trim main spars flush with W1 and W13

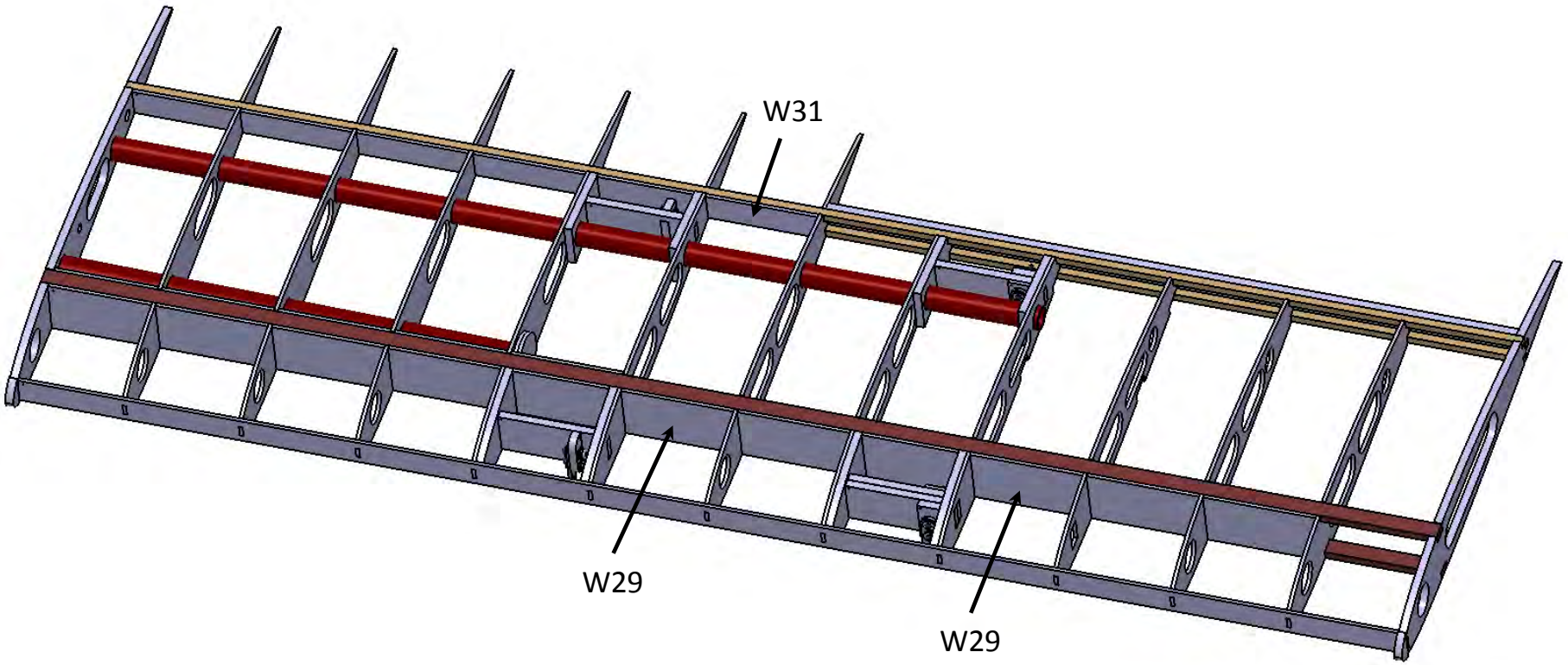




LEFT WING SHOWN

WING ASSEMBLY STEP12b

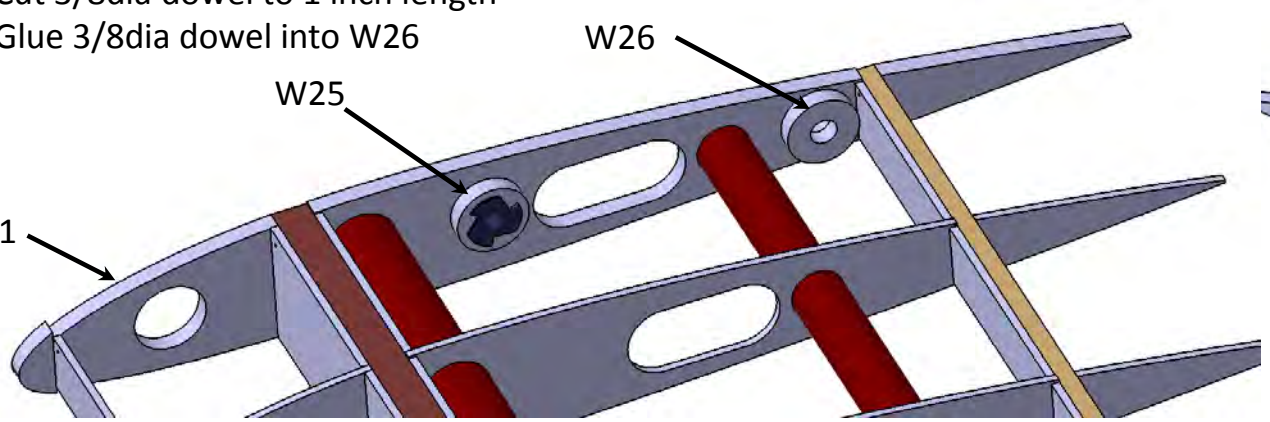
1-Glue (1) W29 webbing between W6 and W7 and (1) W29 between W9 and W10
2-Glue (1) W31 webbing between W6 and W7

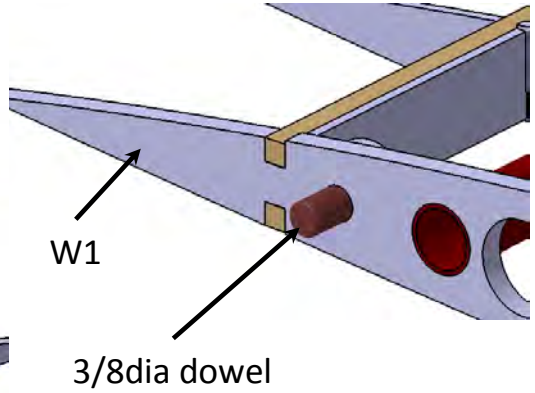


LEFT WING SHOWN

WING ASSEMBLY STEP13

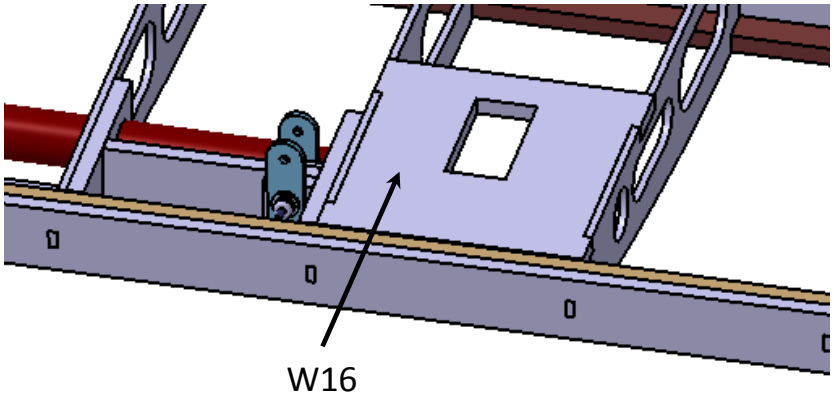
1-Install (1) ¼-20 T-Nut and apply glue to keep in place
2-Glue W25 to W1 as shown
3-Glue W26 to W1 as shown
4-Cut 3/8dia dowel to 1 inch length
5-Glue 3/8dia dowel into W26





WING ASSEMBLY STEP14a

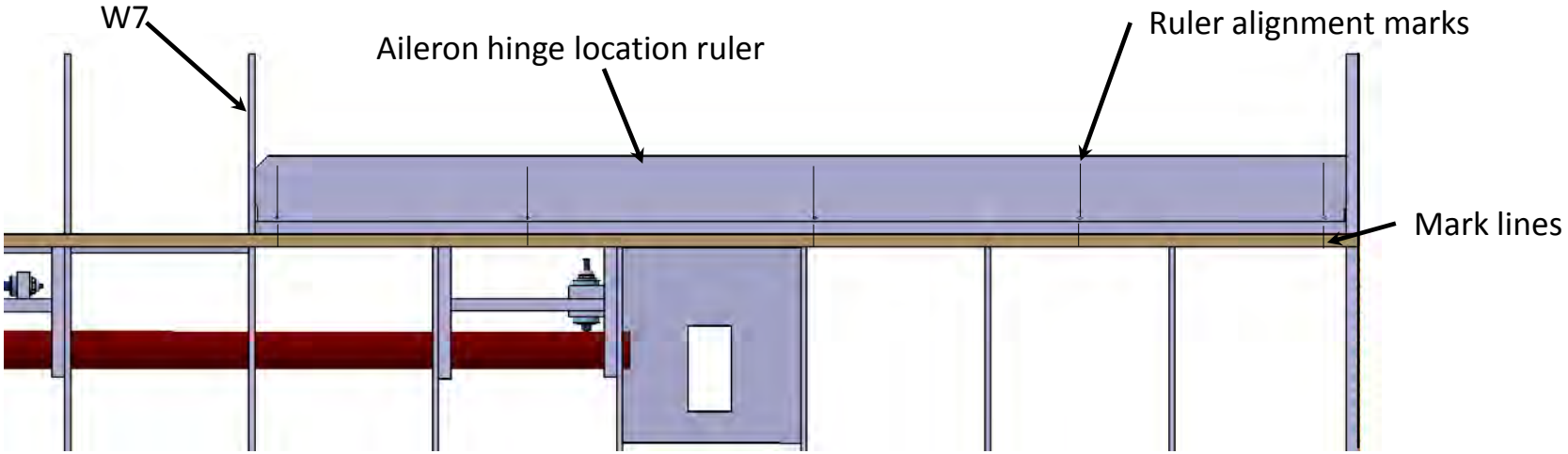
1-Glue W16 as shown

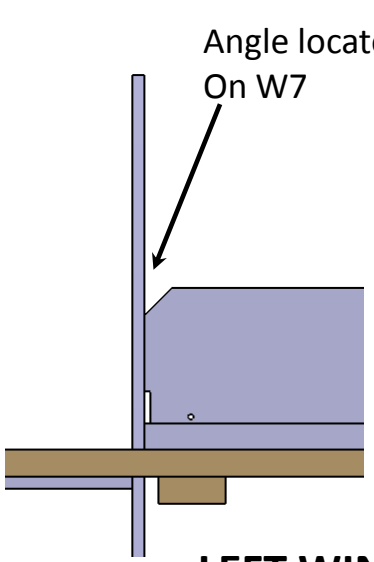


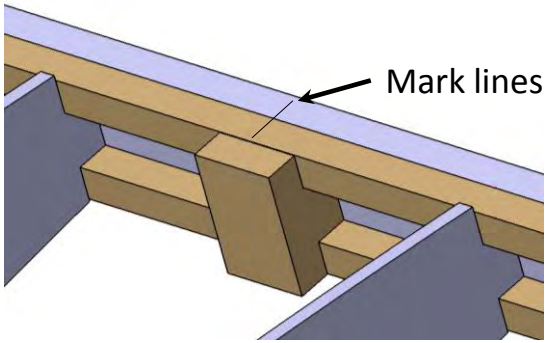
LEFT WING SHOWN

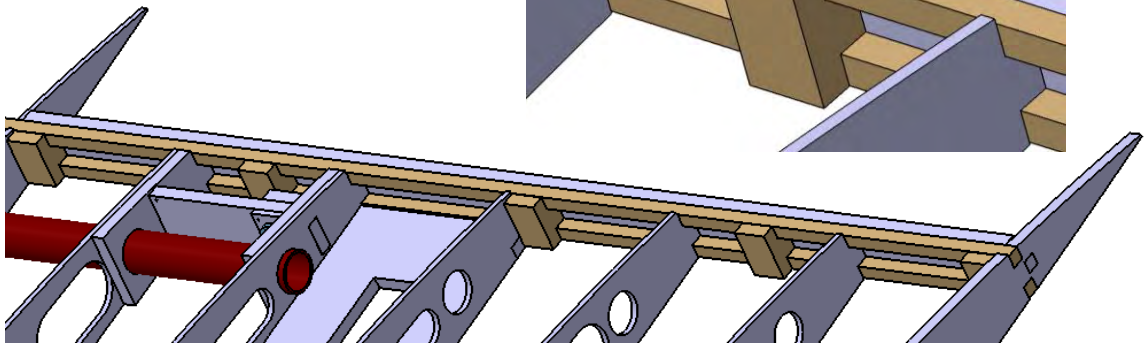
WING ASSEMBLY STEP14b

1-Using aileron hinge location ruler, mark lines on W14 edge
2-Using ¼ scrap balsa, build block ¾'' wide as shown minimum 1/2 '' thick
3-Glue block center with marked lines on W14





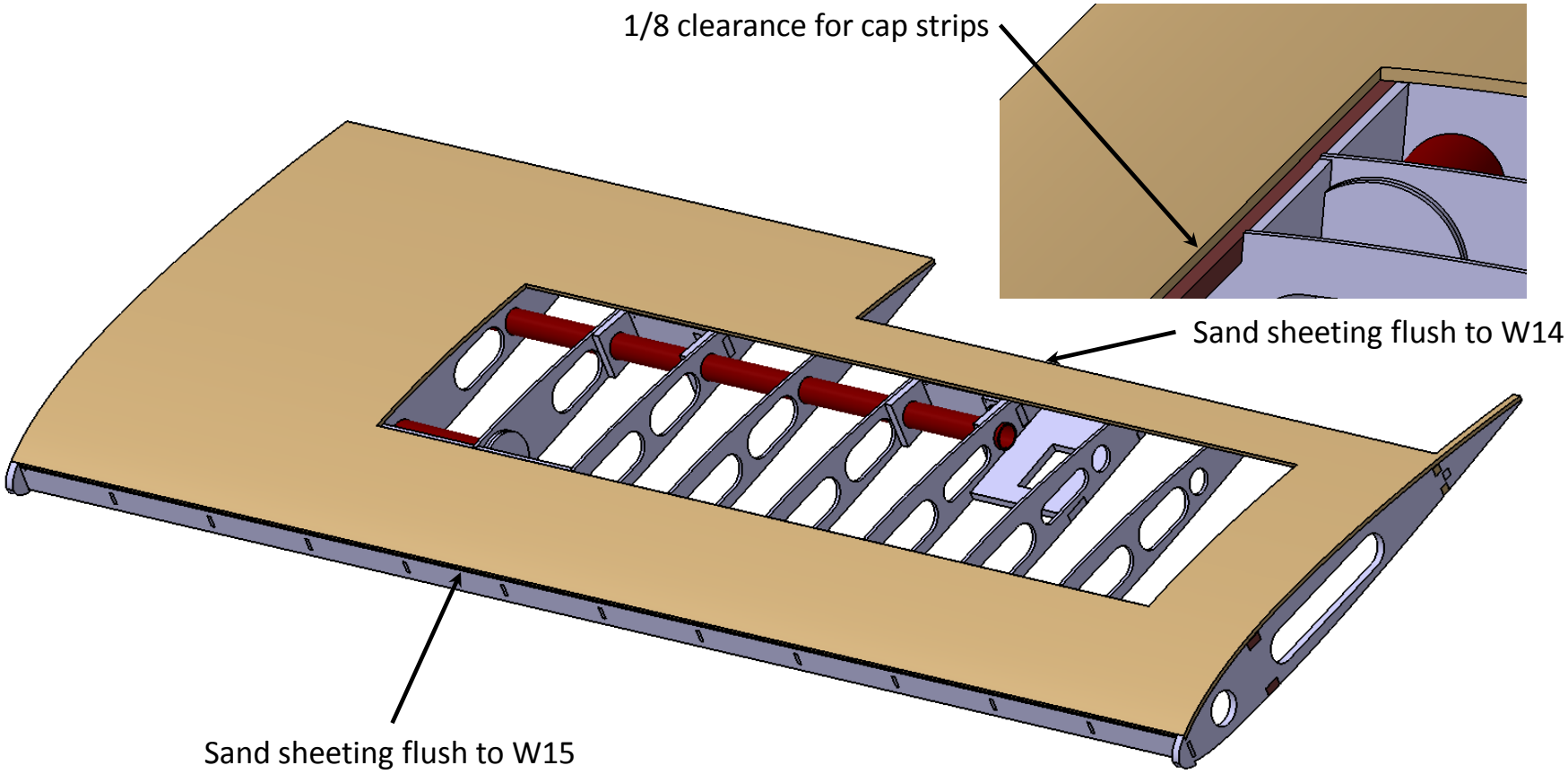




LEFT WING SHOWN

WING ASSEMBLY STEP15

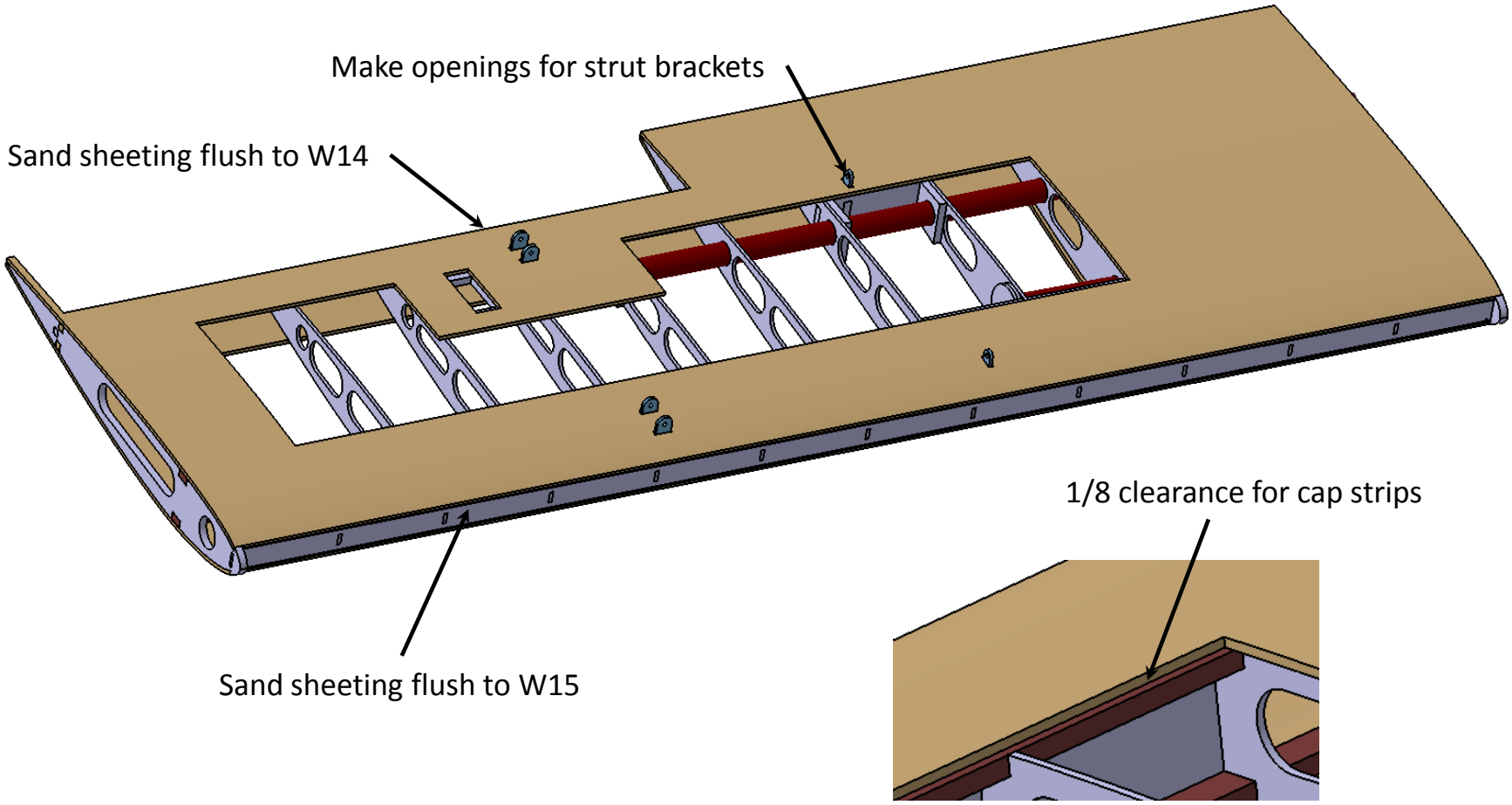
1-Using 1/8X4 balsa sheet, Apply sheeting to top of wing first as shown
Full sheeting between W1 and W4 and between W12 and W13
Leading edge sheeting over main spar but leave 1/8 for best cap strip support as shown
Trailing edge sheeting is 1,5 inch wide
Sand leading edge sheeting flush to W15 and trailing edge sheeting flush to W14 and to ribs end



LEFT WING SHOWN

WING ASSEMBLY STEP16a

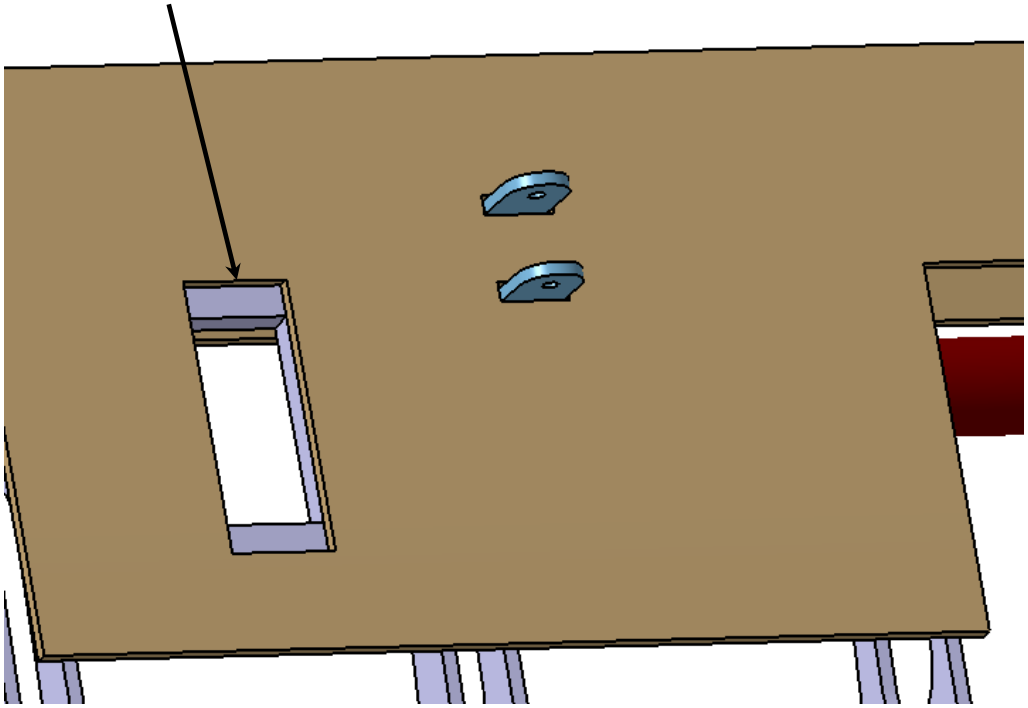
1-Using 1/8X4 balsa sheet, Apply sheeting to bottom of wing as shown
Full sheeting between W1 and W4 and between W12 and W13. Make opening for strut brackets (6 required)
Leading edge sheeting over main spar but leave 1/8 for best cap strip support as shown
Trailing edge sheeting is 1,5 inch wide except between W7 and W9 where it must cover aileron servo mounting plate
Sand leading edge sheeting flush to W15 and trailing edge sheeting flush to W14 and to ribs end



WING ASSEMBLY STEP16b

Aileron servo opening must clear area where servo is to be located for better servo installation

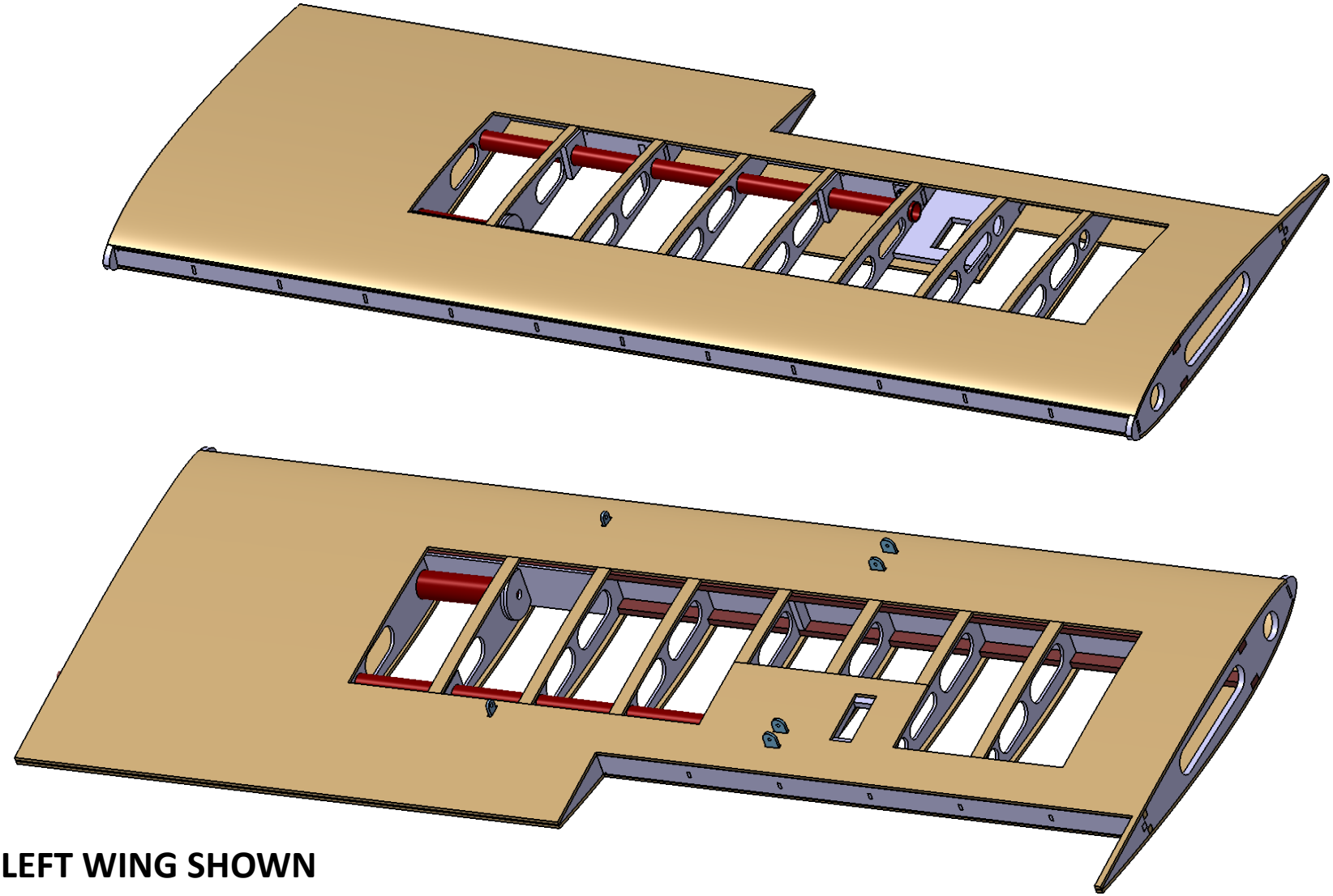
Make openings to clear servo mounting tabs



LEFT WING SHOWN

WING ASSEMBLY STEP17

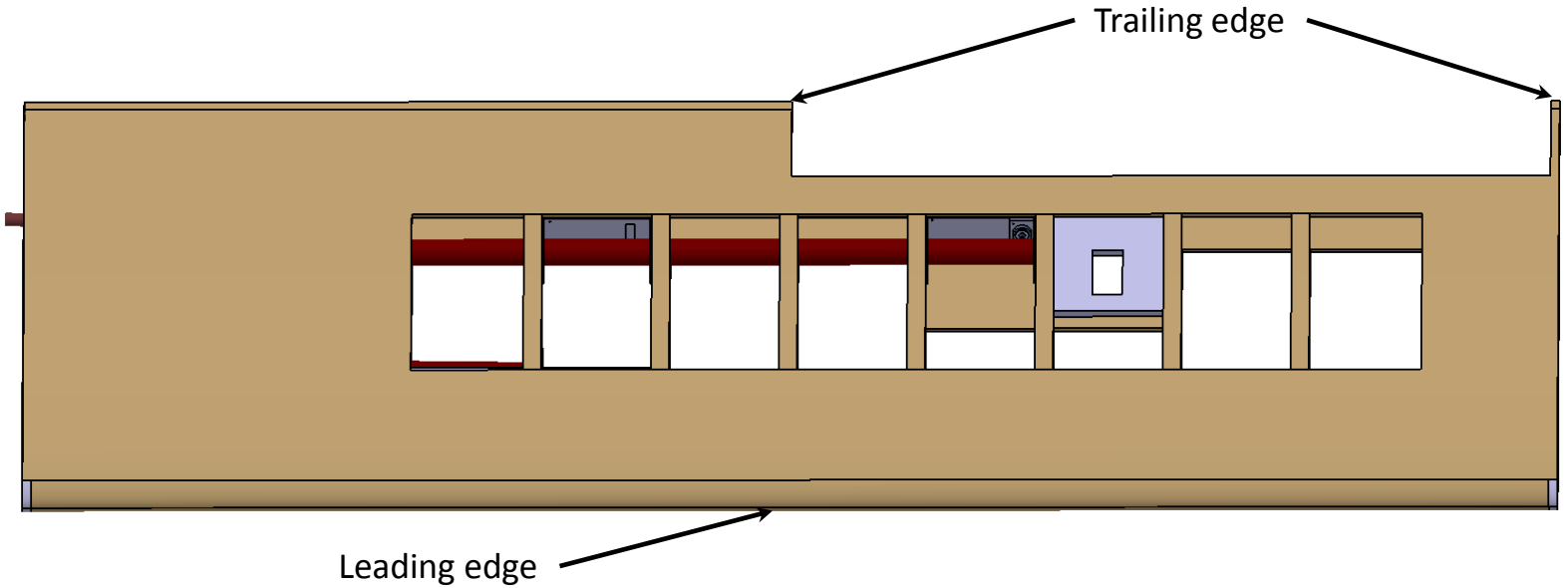
1-Using 1/8X1/2 balsa strips, make cap strips for top and bottom as shown



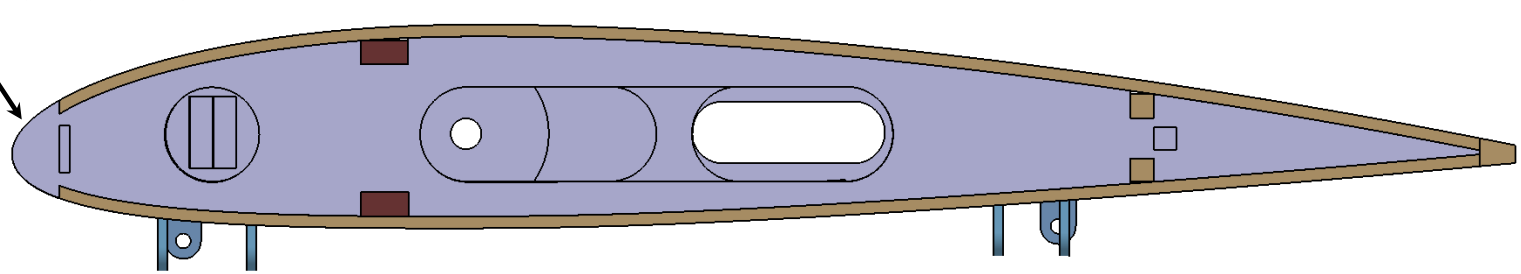
LEFT WING SHOWN

WING ASSEMBLY STEP18

1-Glue ½ 1 ¼ balsa leading edge
2-Glue 3/8sq balsa trailing edge
3-Shape leading edge using W1 and W13 build in leading edge profile
4-Shape Trailing edge as shown



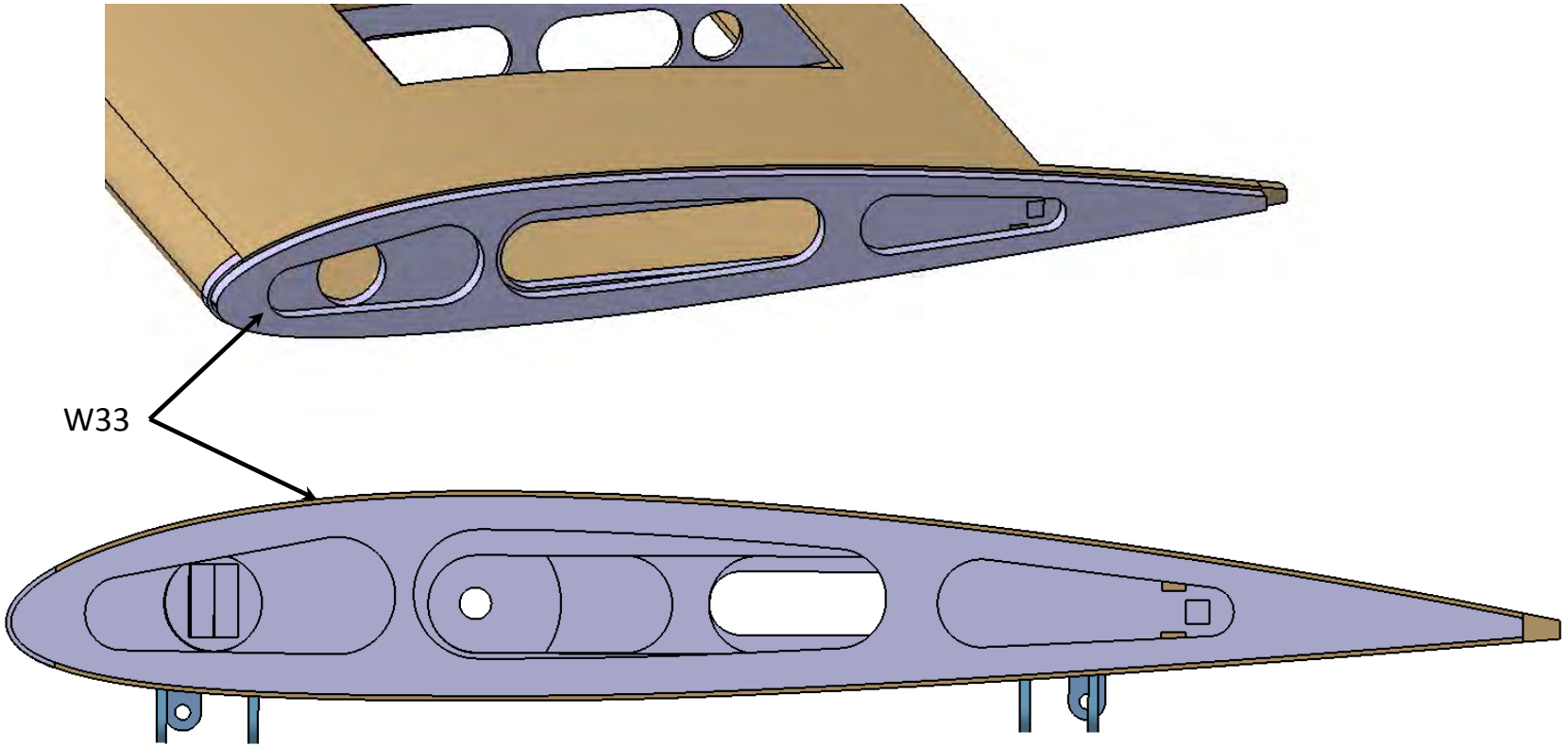
Leading edge shape



LEFT WING SHOWN

WING ASSEMBLY STEP19

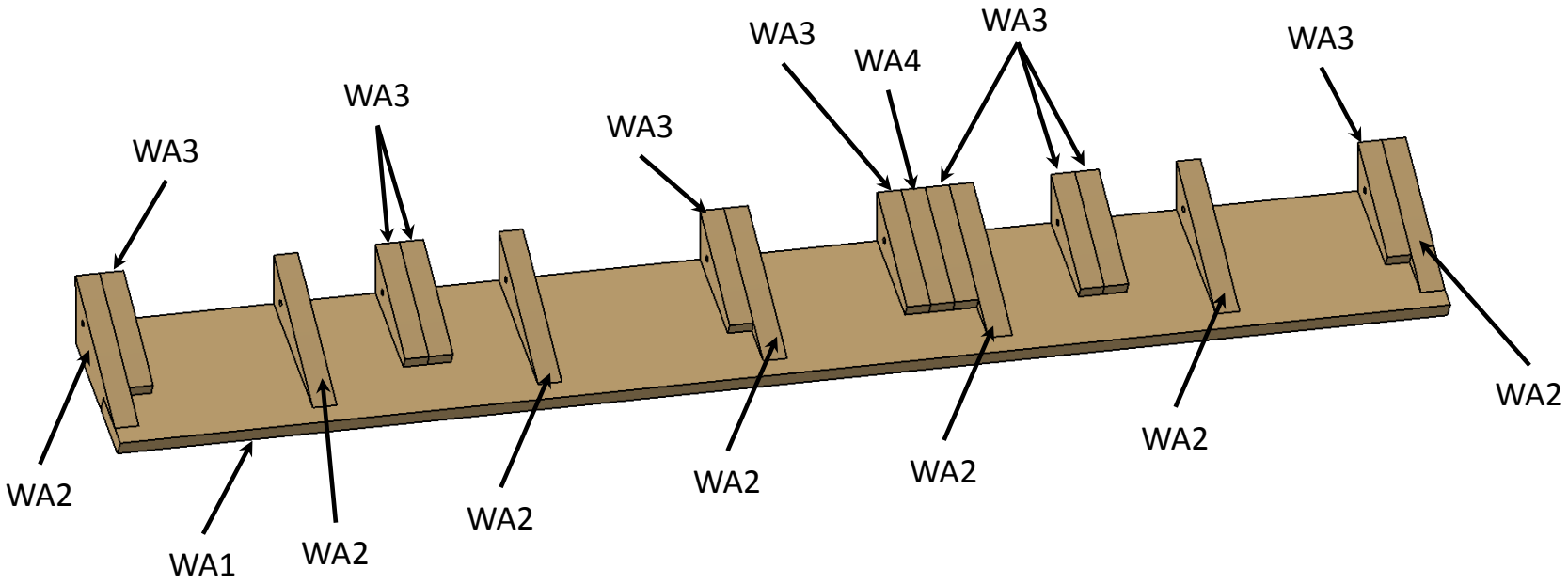
1-Once the wing are covered, glue W33 wing tip support
2-Glue wing tip over W33

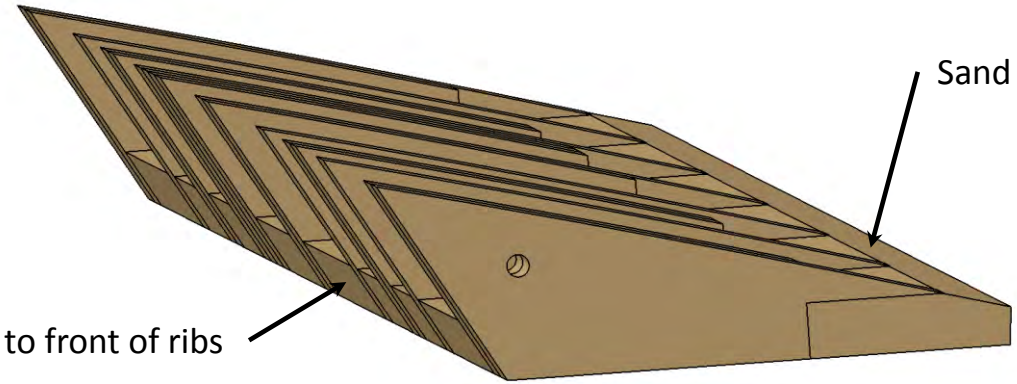


LEFT WING SHOWN

WING ASSEMBLY STEP20a

1-Locate WA1 over a flat building surface
2-Glue (7) WA2, (9) WA3 and 1 WA4 as shown
3-Sand WA1 flus to front of ribs and to top of ribs at trailing edge

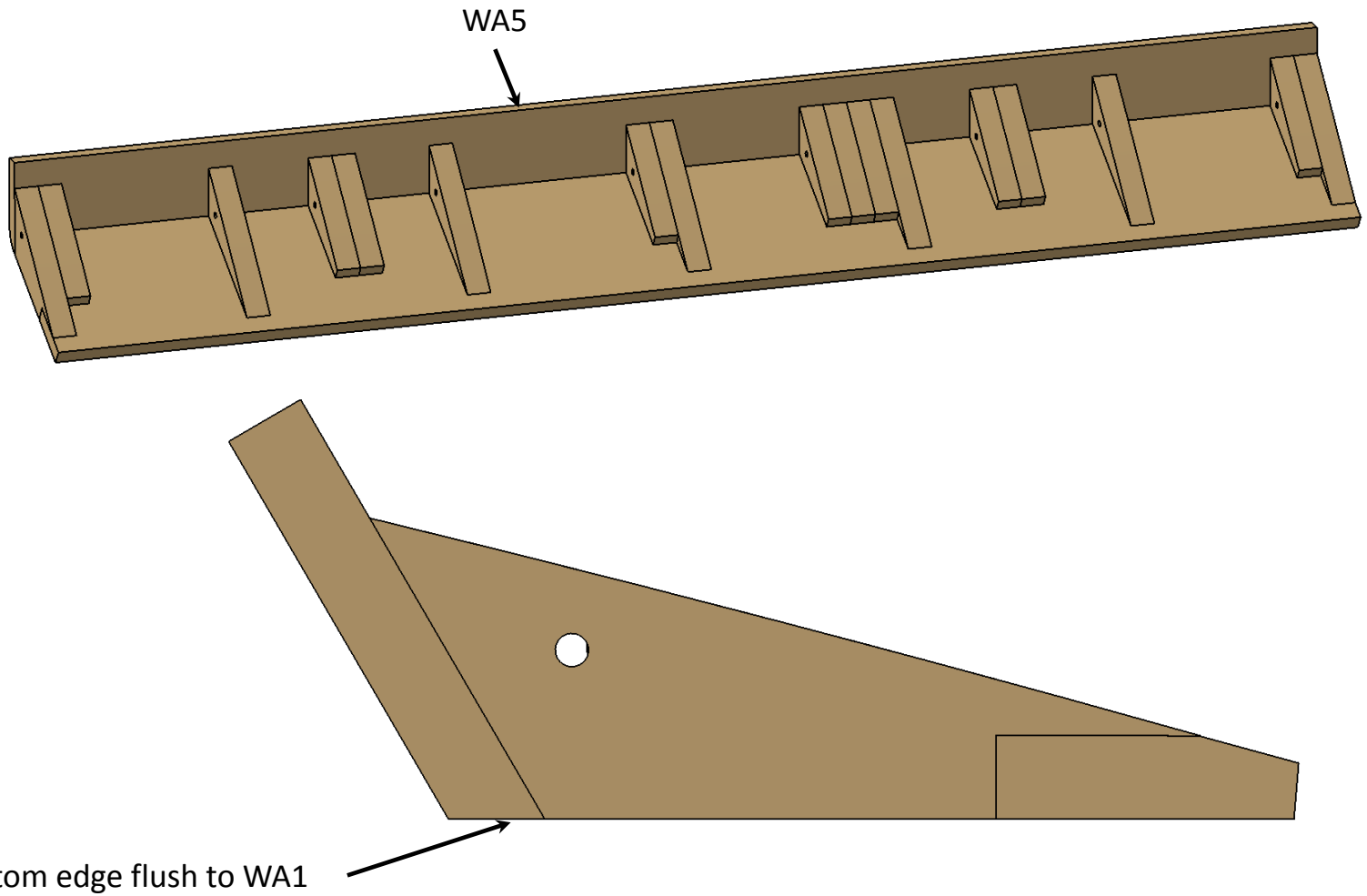




LEFT WING SHOWN

WING ASSEMBLY STEP20b

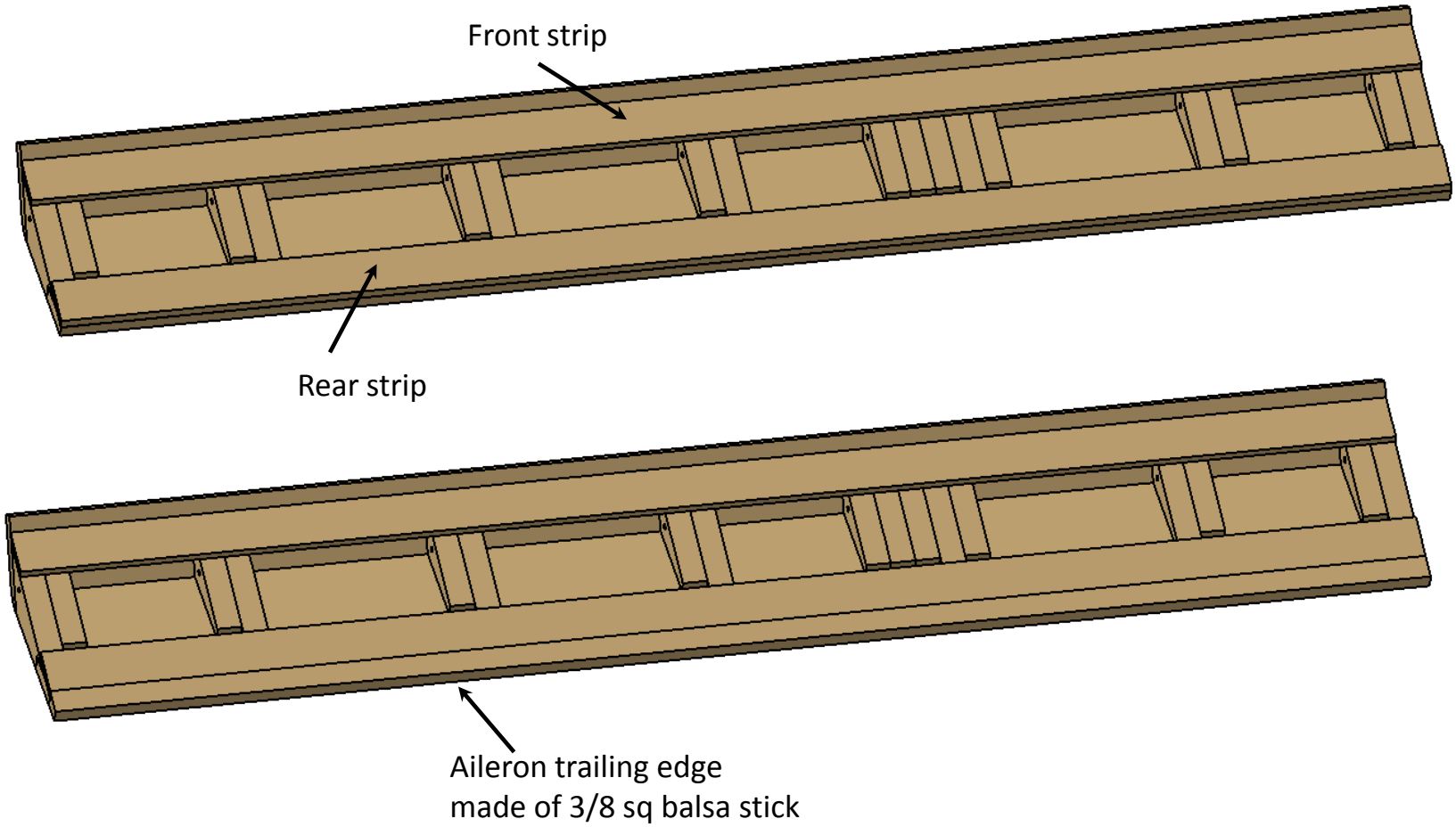
1-WA5 aileron leading edge
2-Sand WA5 bottom edge flush with bottom of WA1



LEFT WING SHOWN

WING ASSEMBLY STEP21

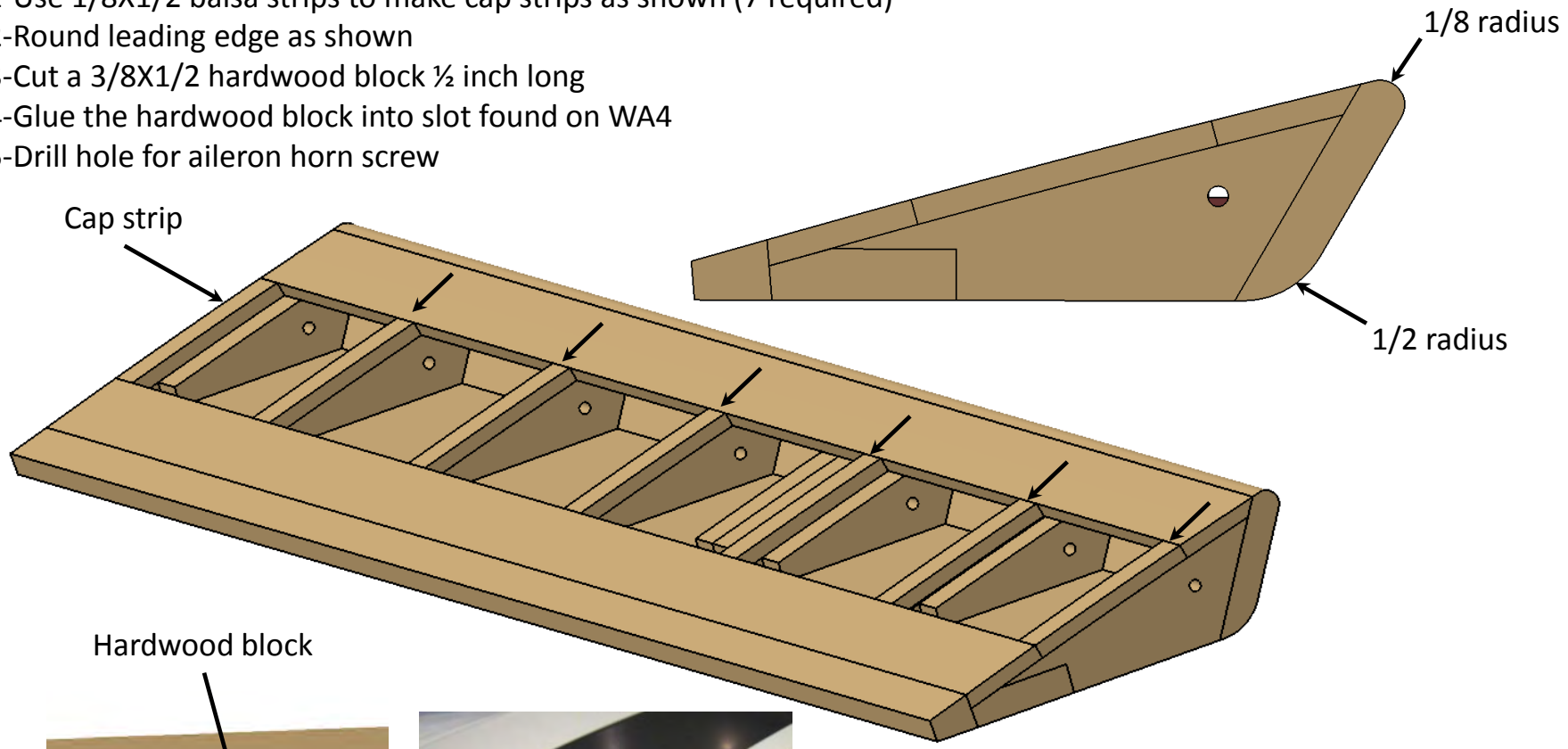
1-Cut (2) strips of 1/8 balsa 21 inches long
2-Glue strips as shown
3-Trim flush with both sides of aileron
4-Glue atrailing edge made from 3/8sq balsa stick

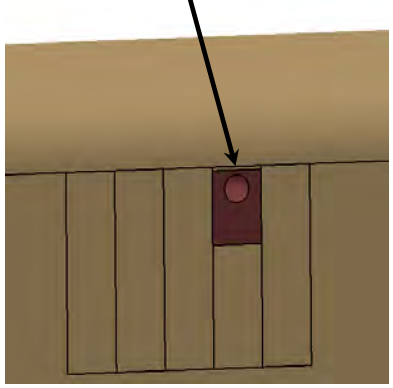


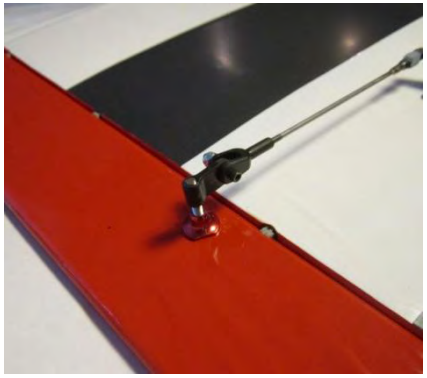
LEFT WING SHOWN

WING ASSEMBLY STEP22

1-Use 1/8X1/2 balsa strips to make cap strips as shown (7 required)
2-Round leading edge as shown
3-Cut a 3/8X1/2 hardwood block ½ inch long
4-Glue the hardwood block into slot found on WA4
5-Drill hole for aileron horn screw





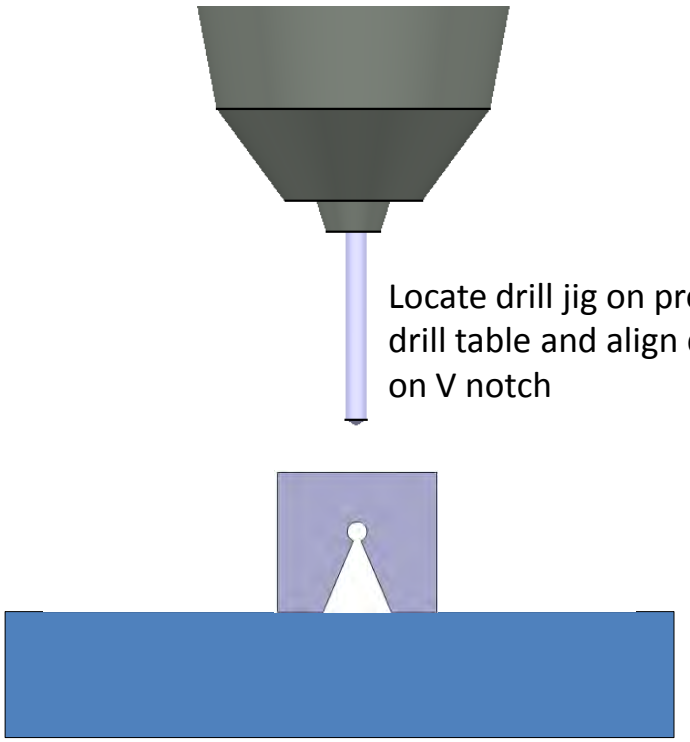


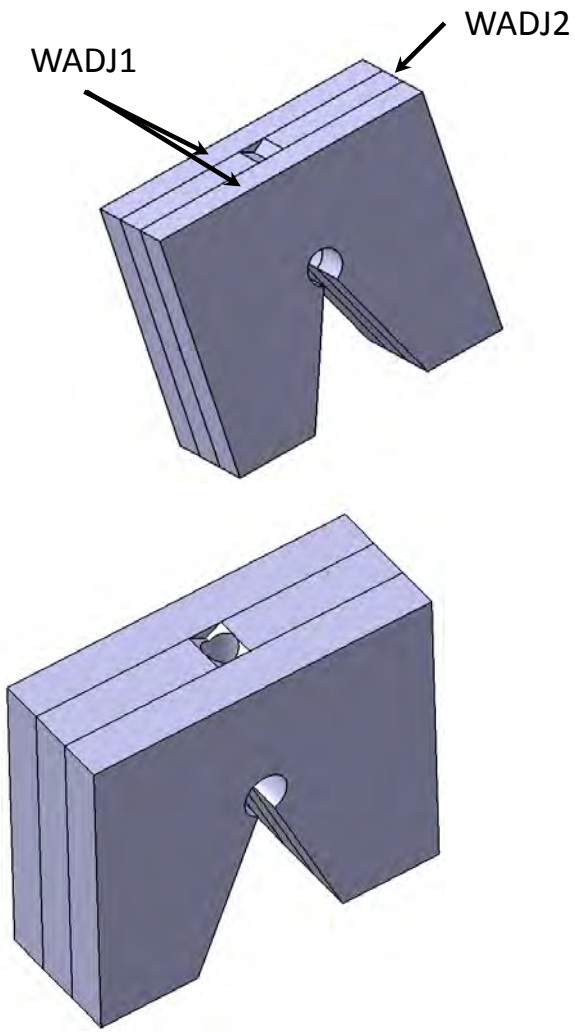
Typical installation
Once aileron is covered
Apply epoxy glue in hole and screw
Install screw in hole
Cut top of screw to install other parts
Trim excess screw if required

LEFT WING SHOWN

WING ASSEMBLY STEP23

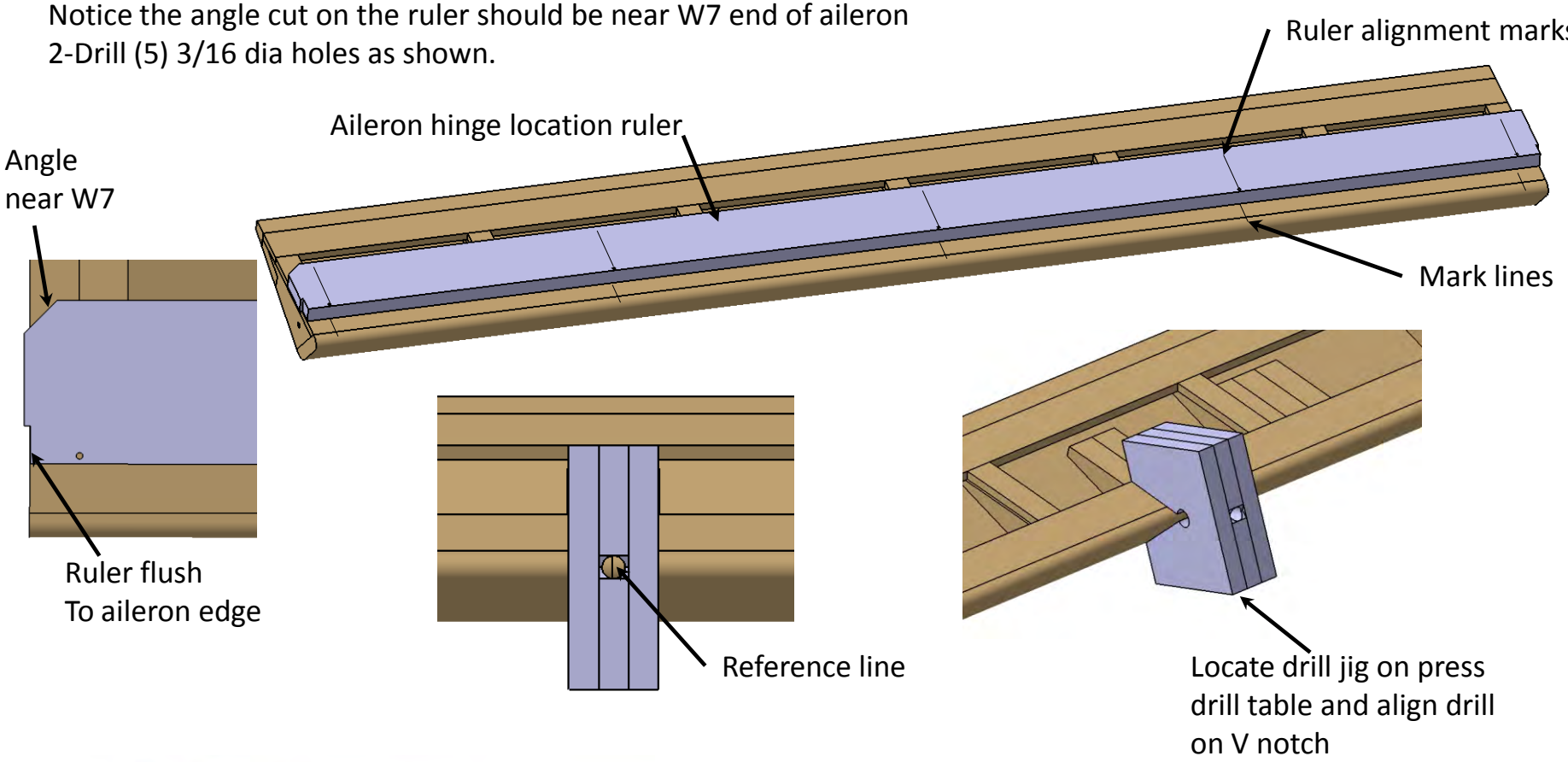
Aileron hinge drill jig assembly:
1-Glue WADJ1 on each side of WADJ2 as shown
2-Drill a 3/16 dia hole in the center of WADJ2 using a press drill

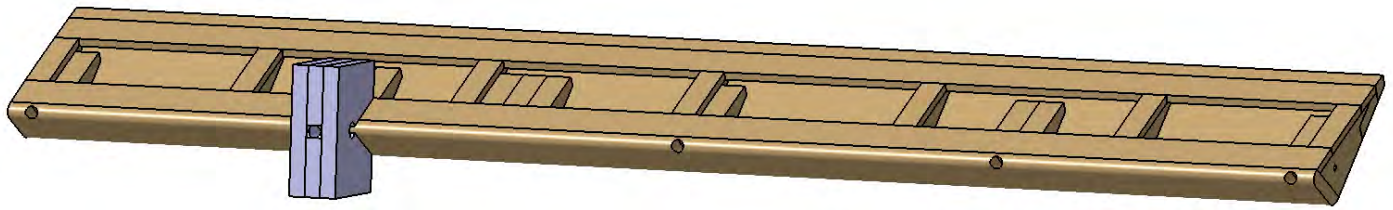




WING ASSEMBLY STEP24

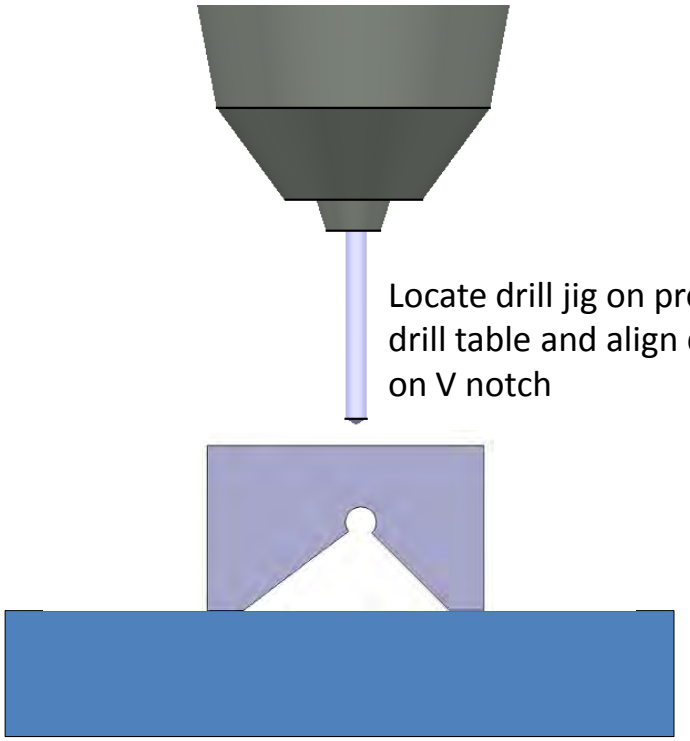
1-Using Aileron hinge location ruler, mark line on aileron leading edge as shown
Notice the angle cut on the ruler should be near W7 end of aileron
2-Drill (5) 3/16 dia holes as shown.

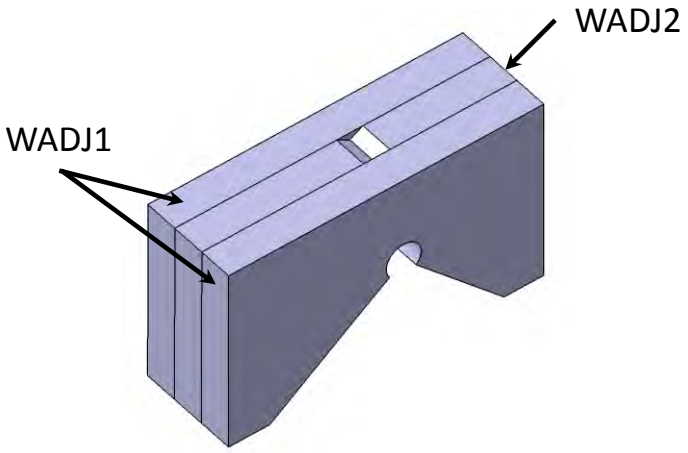


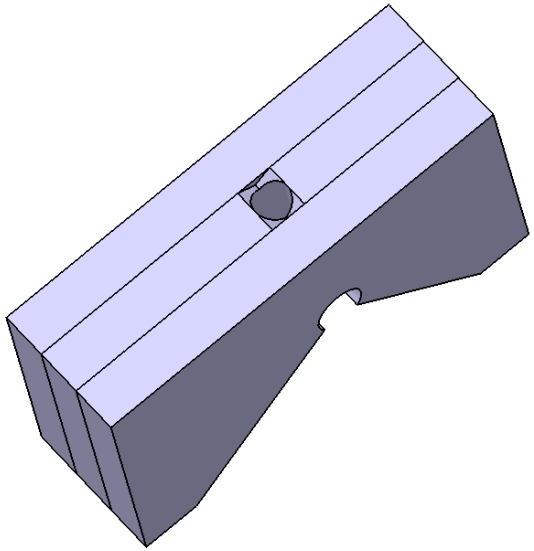


WING ASSEMBLY STEP25

Aileron hinge drill jig assembly:
1-Glue WDJ1 on each side of WDJ2 as shown
2-Drill a 3/16 dia hole in the center of WDJ2 using a press drill

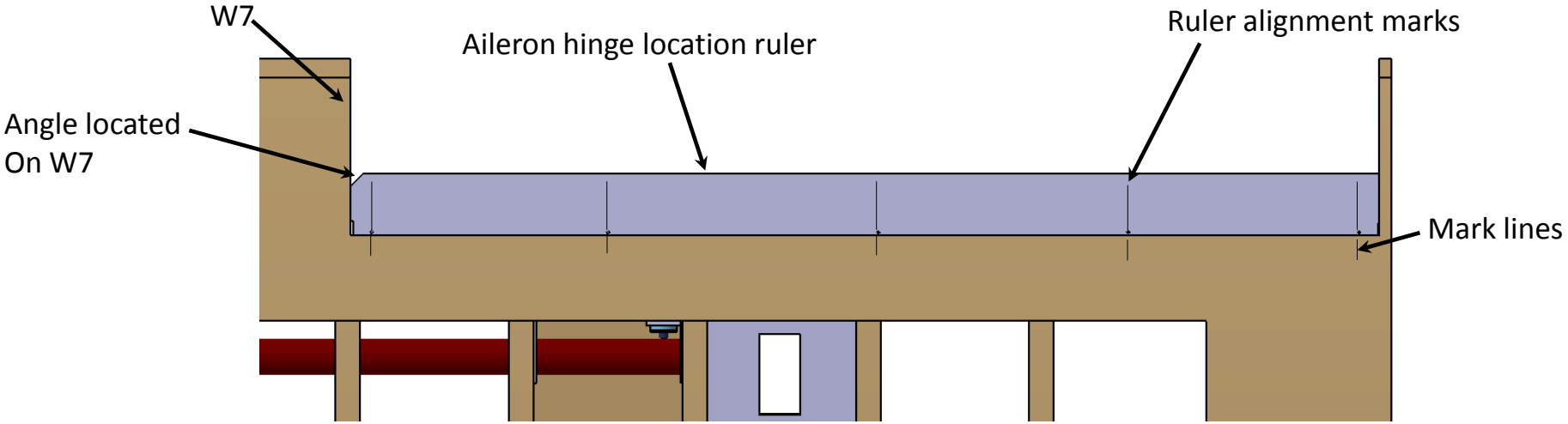


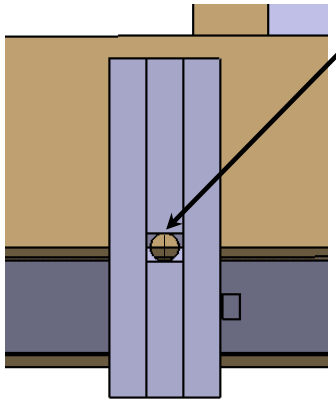


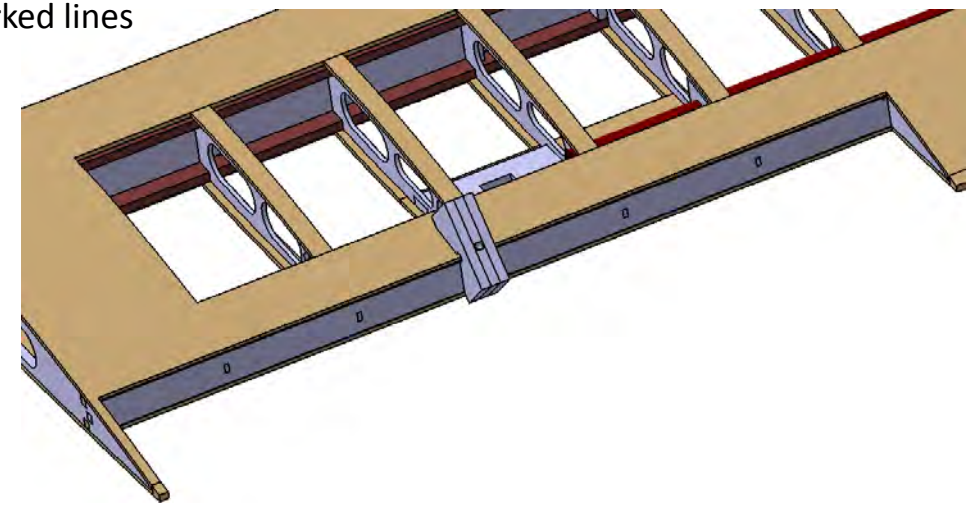


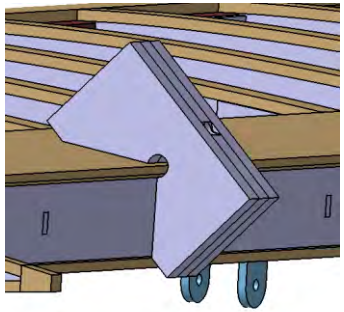
WING ASSEMBLY STEP26

1-Using aileron hinge location ruler, mark lines on wing sheeting
2-Using WDJ1 wing drill jig, ailgn on marked lines and drill (5) 3/16 dia holes









Drill jig location

LEFT WING SHOWN

DOOR ASSEMBLY

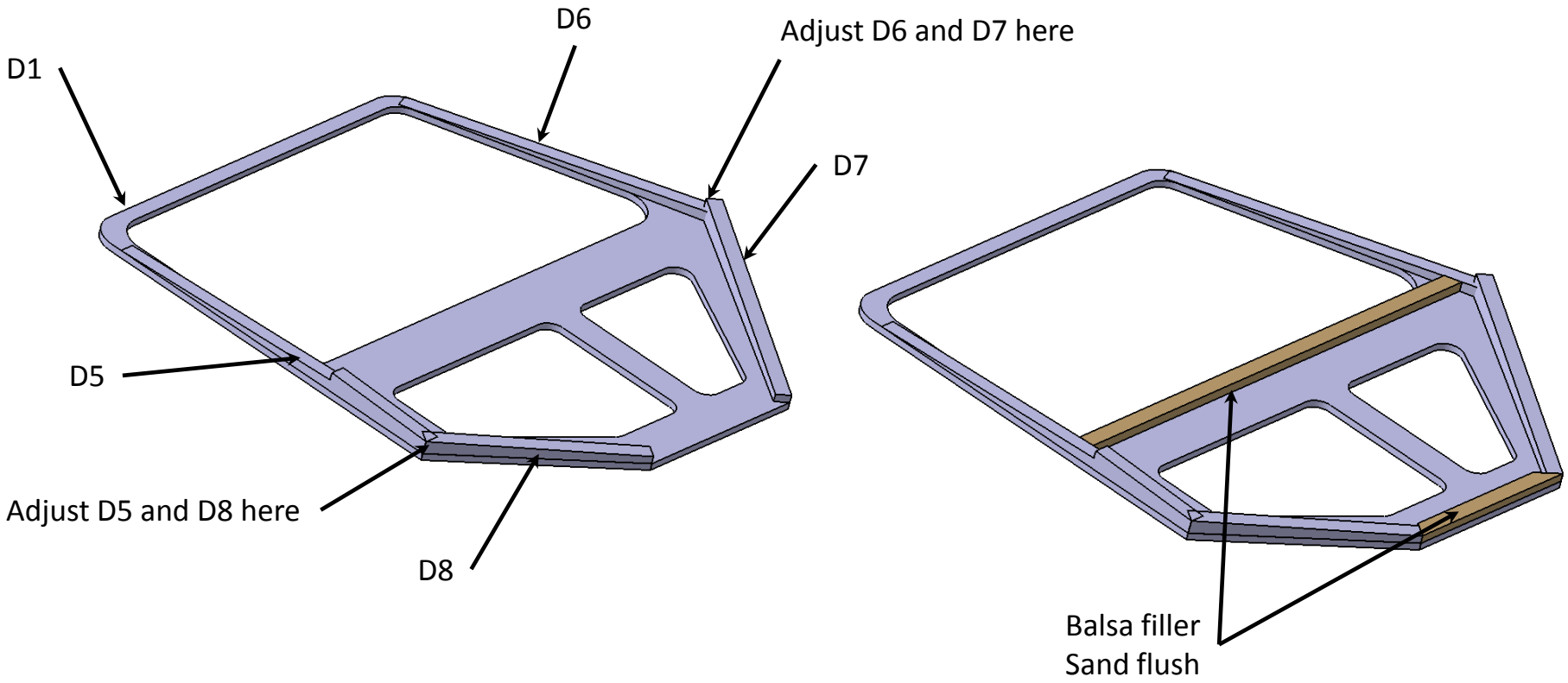
Follow directions carefully

Always dry fit first

Assemble all components on a flat building board

DOOR ASSEMBLY STEP1

1-Install D1 on a falt building surface
2-Adjust D5 and D8 to remove interference
3-AdjustD6 and D7 to remove interference
4-Glue on D1 parts D5, D6, D7 and D8
5-Glue balsa filler as shown and sand flush

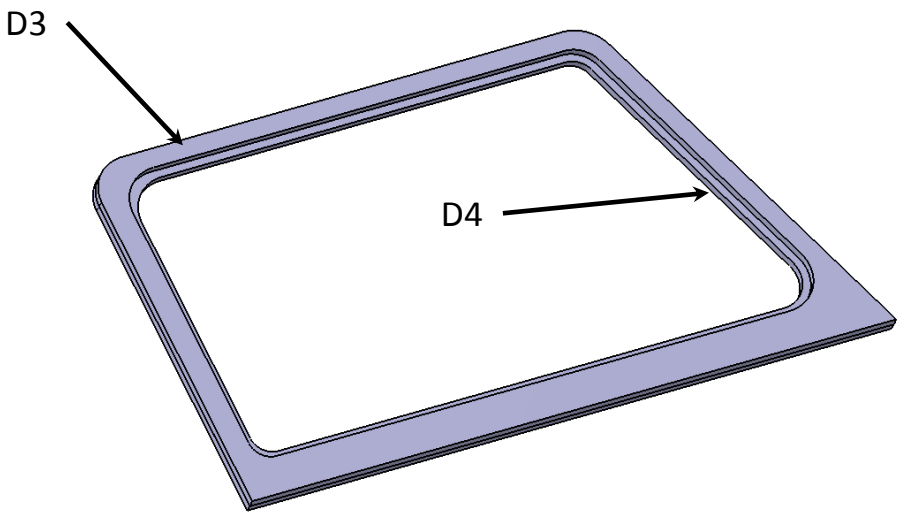


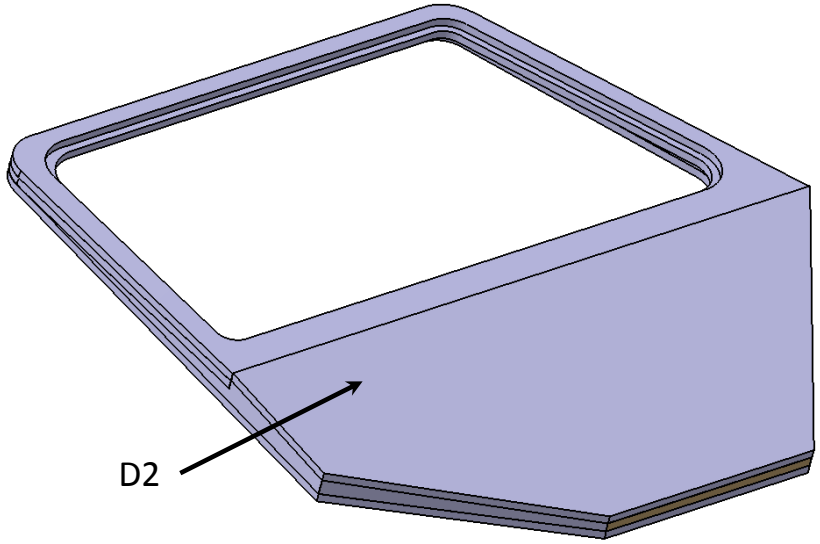
Drill jig location

LEFT WING SHOWN

DOOR ASSEMBLY STEP2

1-Glue on D3 over D4as shown
2-Glue D3 and d4 assembly over STEP1 assembly
3-Glue D2 on assembly
4-Once plane is covered, glue window in frame.

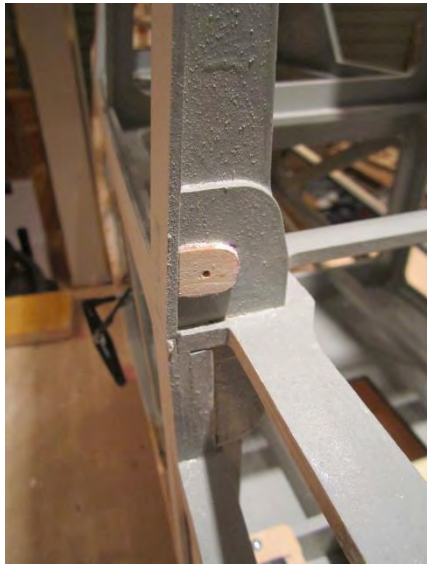


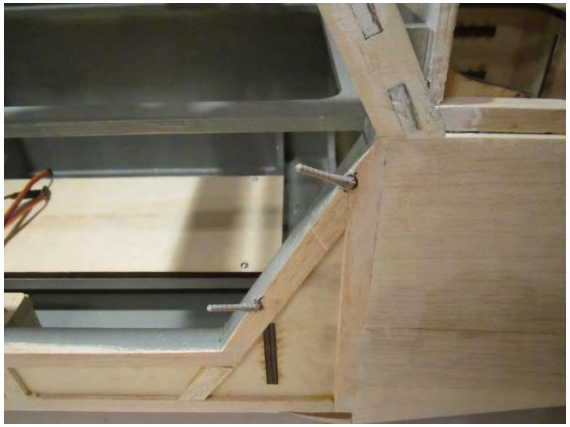


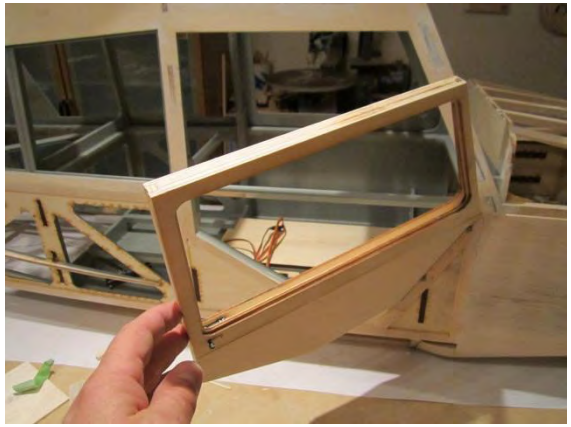
Drill jig location

LEFT WING SHOWN

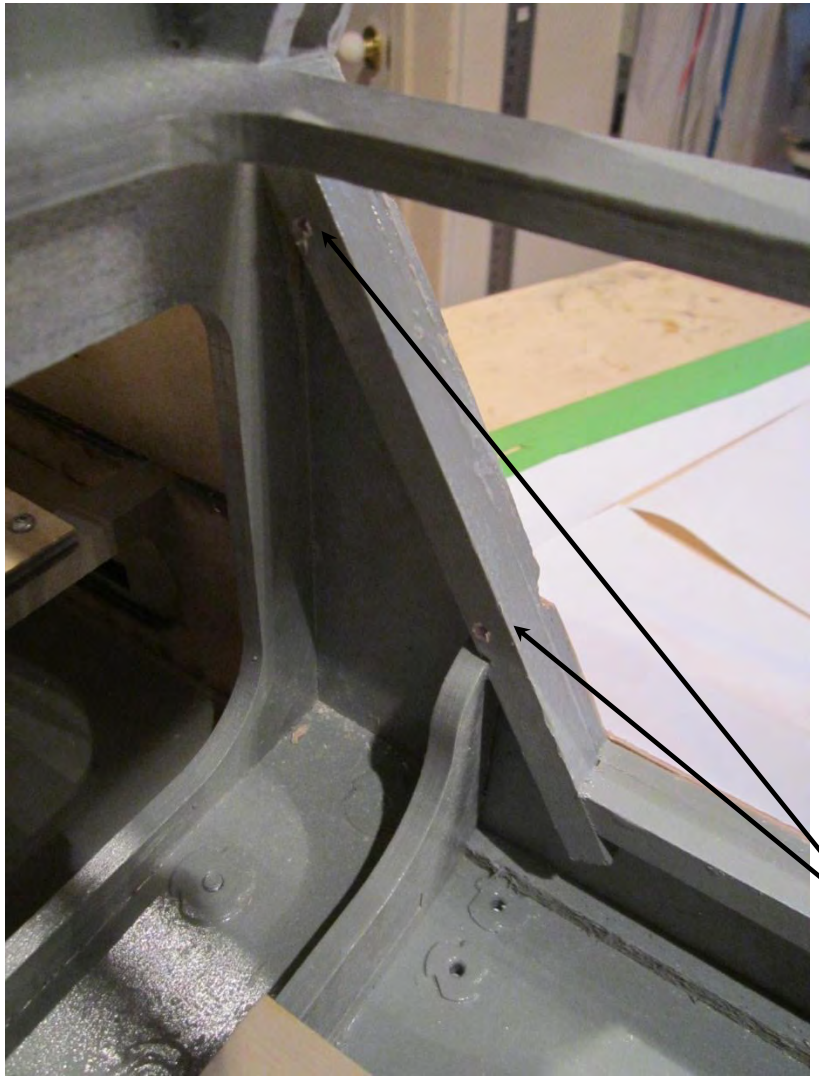
DOOR ASSY PICTURES

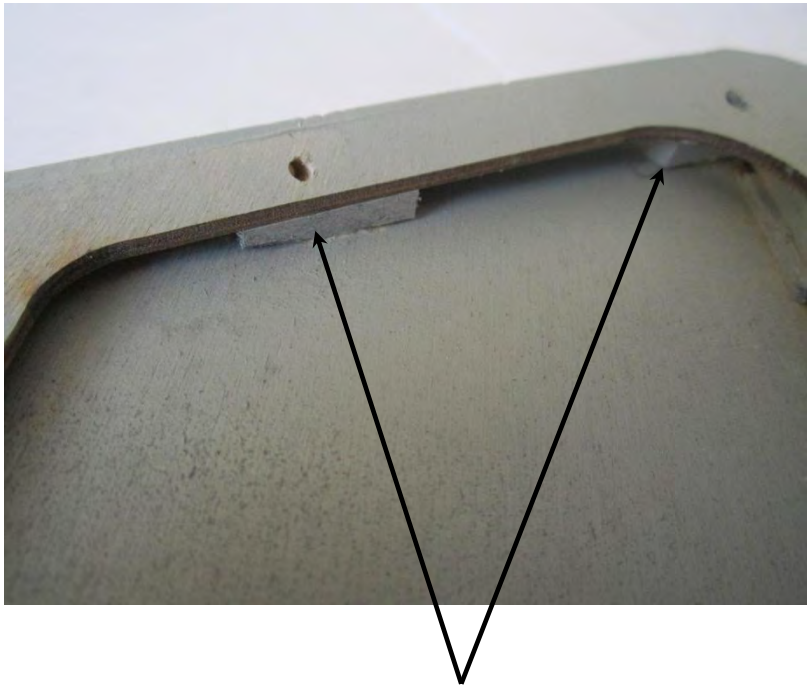






DOOR ASSY





Add balsa blocks between lower door panels to support hinges

Hinge holes located in fuselage front door frame. Add 3/8sq balsa sticks around door frame

COWLING INSTALLATION

The following pictures explain the installation of the cowling.

Pictures shown are from the **35% Decathlon** but the method is similar.

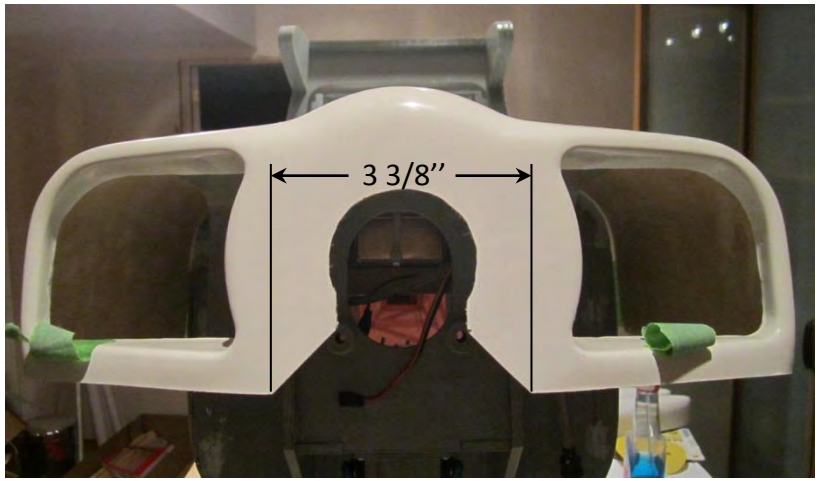
Builder may choose different method for cowling installation .

TOP COWLING PREPARATION

Prepare top cowling as follow:
There are two methods for trimming the top cowling. The easy one and the more scale like method
1-Easy method:
Measure engine hub diameter and cut the front face of the cowling to clear the hub 1/8 all around. Install engine to verify proper clearance. Open both intake vents.

2-Scale like method:
Make the hole to clear engine hub first using a Dremel or equivalent rotary tool. Using a thin saw or a thin rotary cutter, cut the lower portion of the face at 45 degrees on both sides. Keep the removed part. It will be glued to the bottom cowling.

Easy method



Scale method

BOTTOM COWLING PREPARATION-1

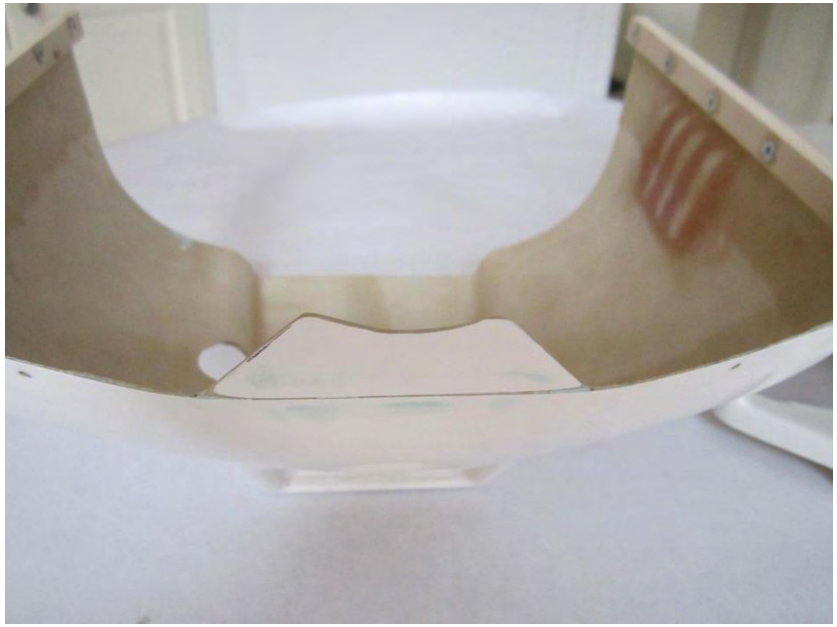
Prepare bottom cowling as follow:

1-Open up the rectangular cooler hole located under the light. You can choose to open the light as well depending what you want to do with it.

2-Measure engine exhaust pipes locations and open up the cowling. It is much safer to enlarge the holes slowly to avoid enlarging the holes too much.

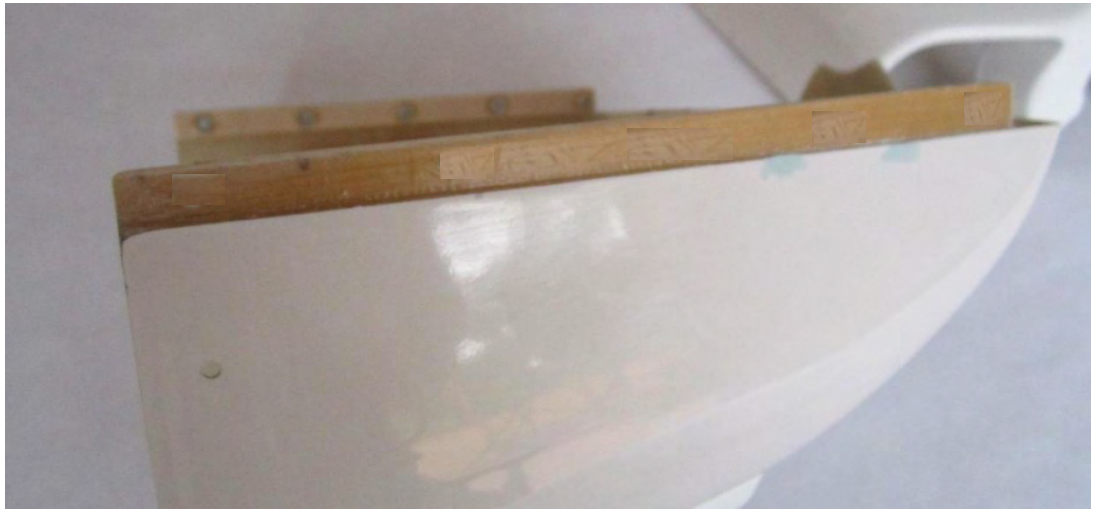
BOTTOM COWLING PREPARATION-2

Prepare bottom cowling as follow:
Scale like method:
1-Align the part removed from the top cowling part on the lower cowling part. Use masking tape to keep it at the proper location.
You will need fiber glass cloth and laminating epoxy for the next step.
2-Apply epoxy glue inside the cowling to cover the added part and the area of the bottom cowling adjacent to it.
3-Place a piece of fiber glass cloth over the glue and make the glue penetrate the fiber. Make sure it is square with the side edge of the cowling.
4-Secure the assembly until it is dry. With this type of epoxy, It usually take over 8 hours to set.
5-When dry, sand flush and use filler to close any gap.



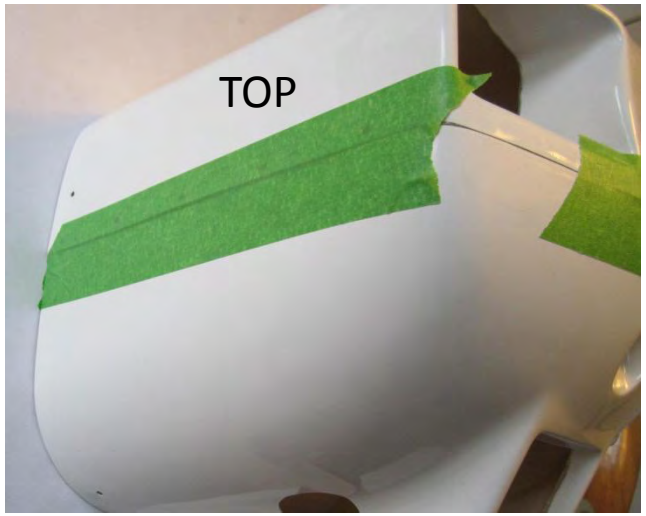
BOTTOM COWLING PREPARATION-3

Now it is required to reinforce the cowling flange with a piece of 1/4 X 1/2 hardwood stick
1-prepare (2) piece of 1/4 X 1/2 hardwood stick 8 1/2'' long.
2-Using laminating epoxy, glue the sticks **INSIDE** the cowling fiberglass flange. This flange is made wider than necessary and will be trimmed after glue is dry. Apply clamps while the epoxy cure.
3-Trim the excess flange material flush to the hardwood stick on both sides.

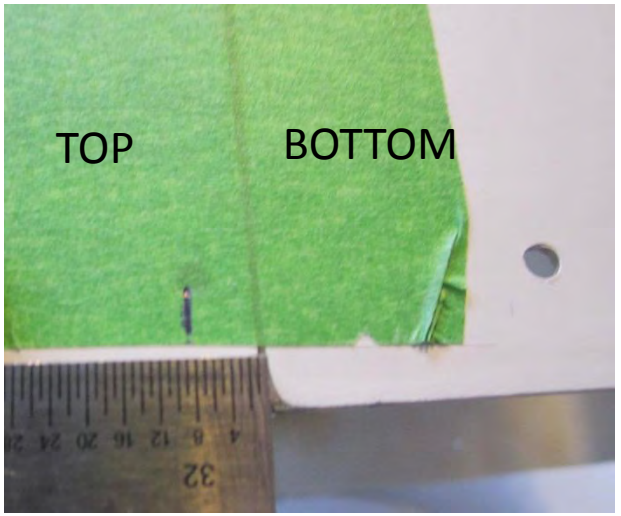


MATING TOP AND BOTTOM COWLING-1

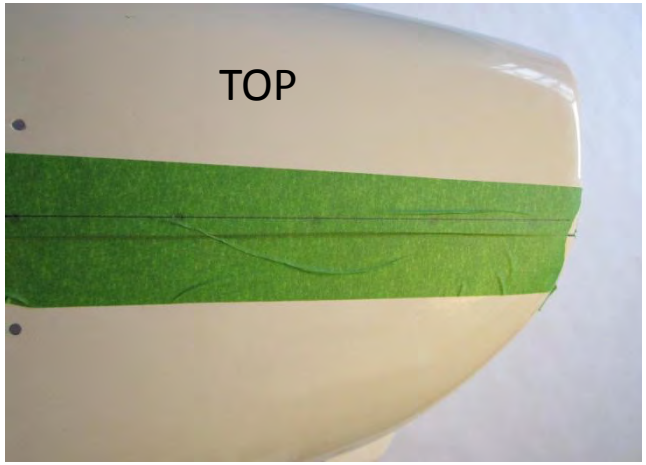
1-Fit both parts together using masking tape.



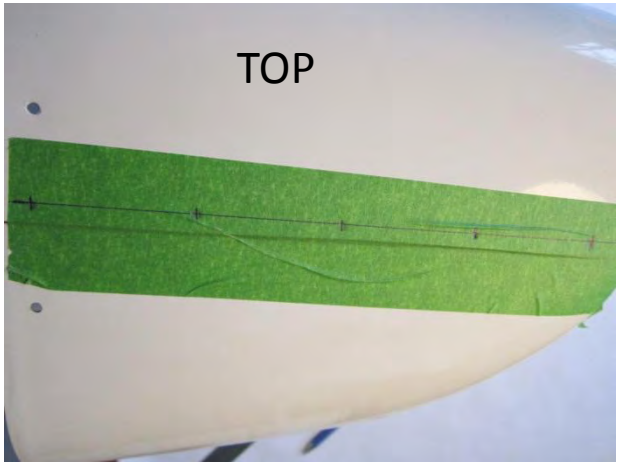
2-Measure ¼'' at front and rear end of the cowling.
MAKE THE LINE OVER THE TOP COWLING AREA



3-Make a line between both marks and locate the first hole at ½'' from rear end of cowling.

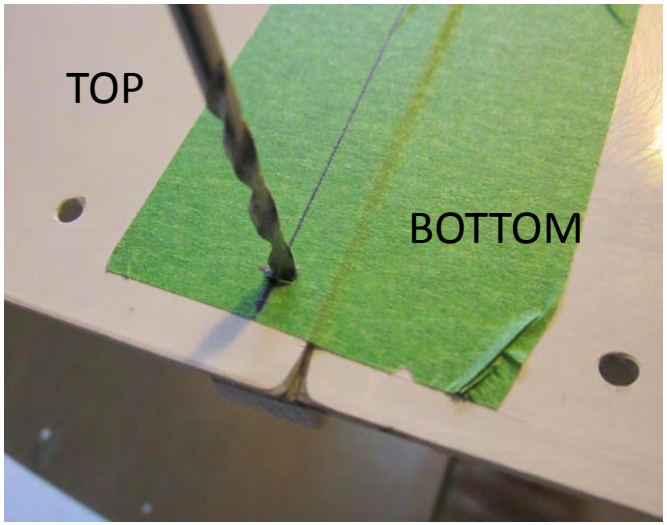


4-Mark other holes at 1 15/16'' spacing

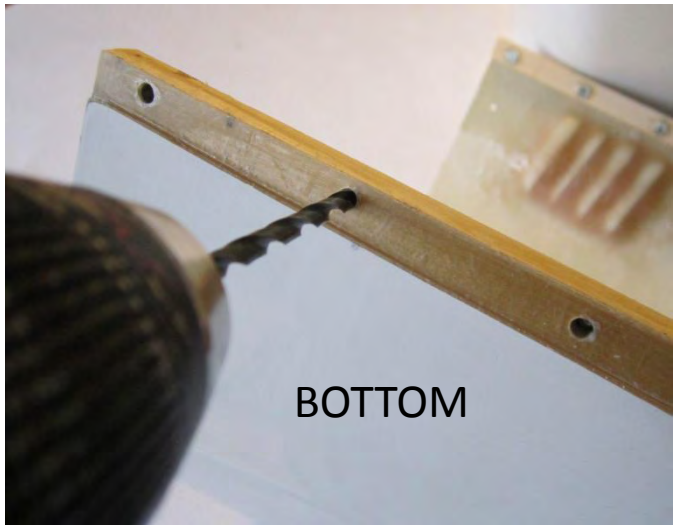


MATING TOP AND BOTTOM COWLING-3

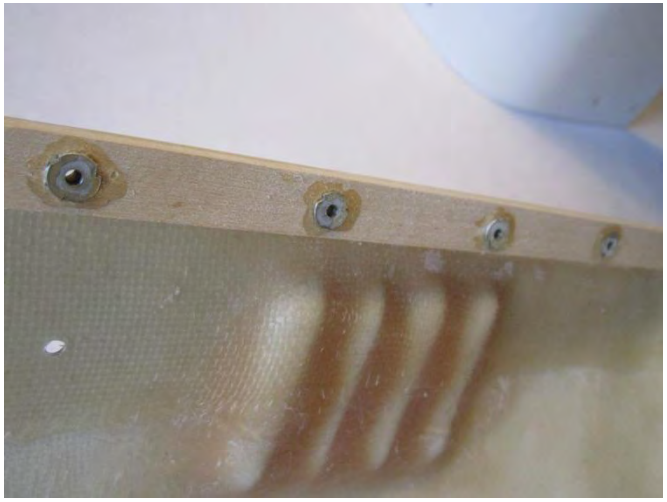
5-Drill 7/64 diameter holes at locations marked. Drill through both parts



6-Separate parts and enlarge holes in bottom cowling part to 5/32 diameter



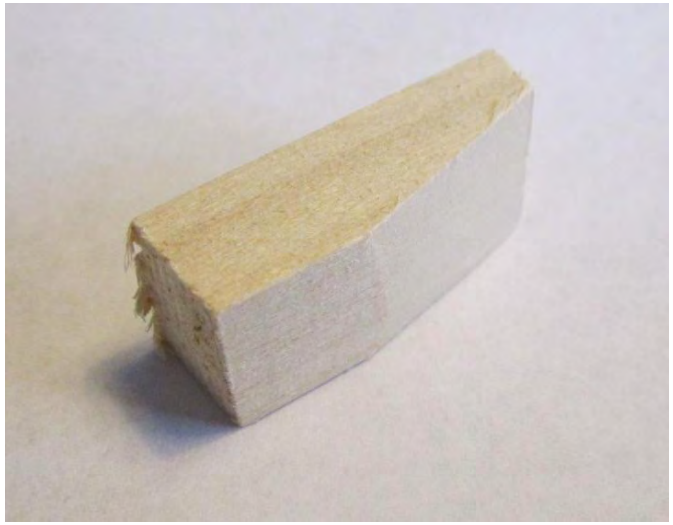
7-Install (10) 4-40 T-nuts on flange both sides and secure them with glue.



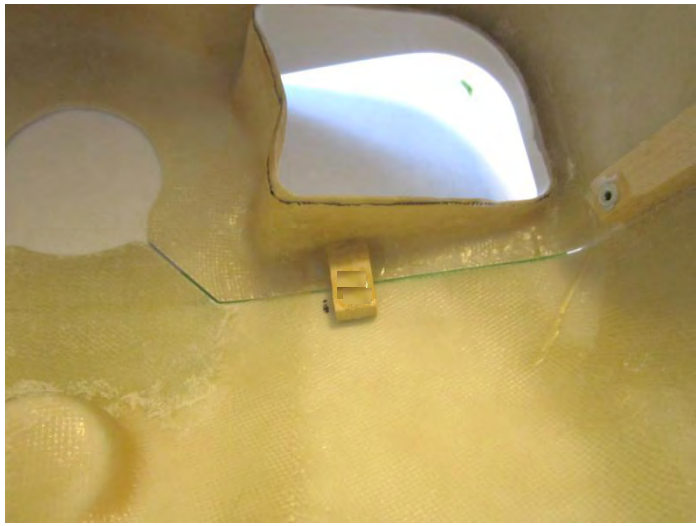
8-Reassemble both cowling halves using 4-40 X ½'' long for next step.

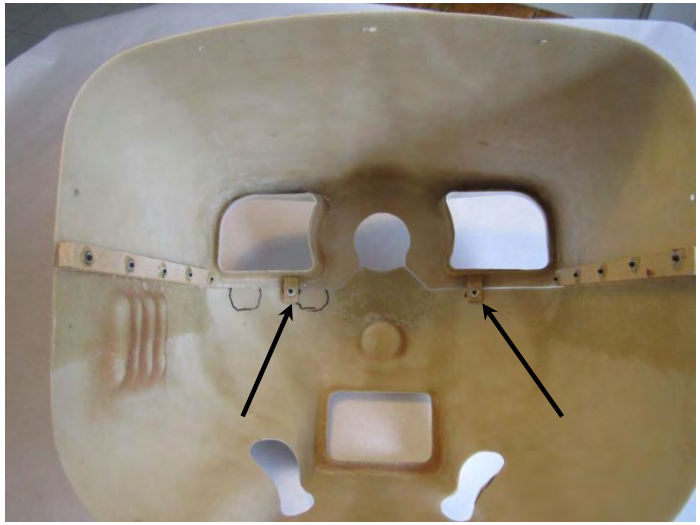
MATING TOP AND BOTTOM COWLING-4

9-Make (2) blocks 1’’ long from ¼ X ½ hardwood and sand a wedge shape at 1 end to fit inside top cowling



10-The wedge should fit as shown in this picture and locate the bottom part properly.



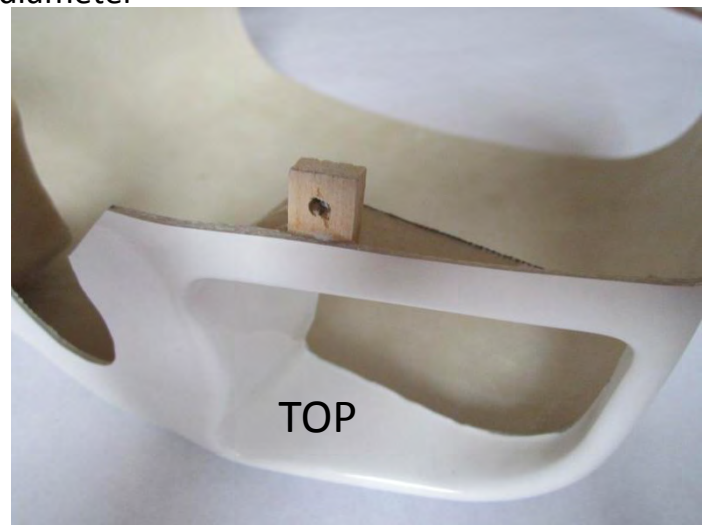


11-Locate and glue the hardwood parts using laminating epoxy made thicker using sand dust inside the top cowling.
Let cure for 8 hours

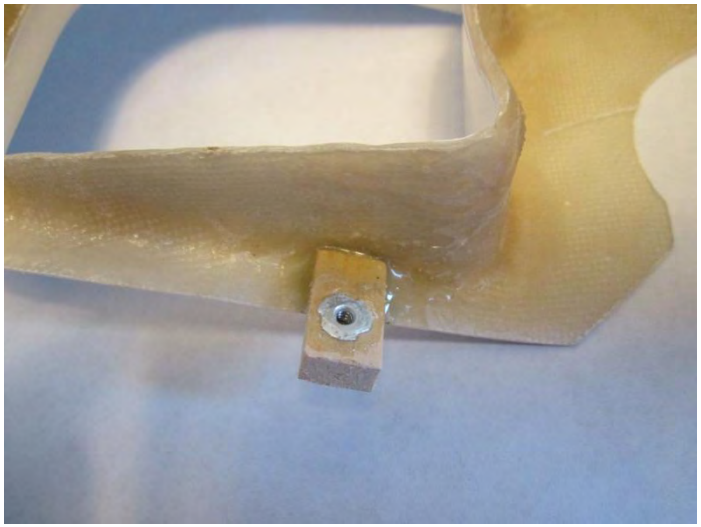
12-Mark location of the blocks on a piece of tape placed in front of cowling
13-Drill 7/64 diameter holes at locations
14-Separate parts

MATING TOP AND BOTTOM COWLING-5

15-Enlarge holes in top cowling blocks to 5/32'' diameter



16-Install (1) 4-40 T-nut in each holes

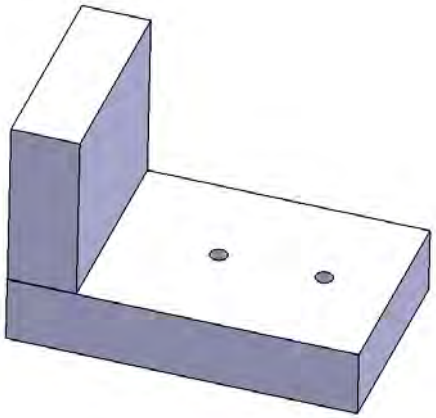


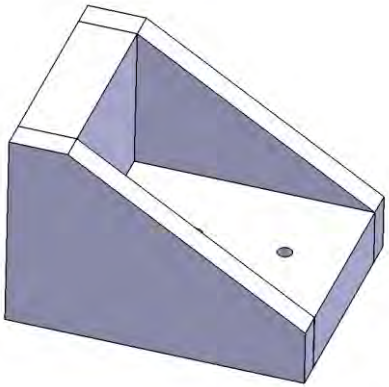
17-Use (12) 4-40 button head cap screws ½'' long to assemble both cowling parts together.

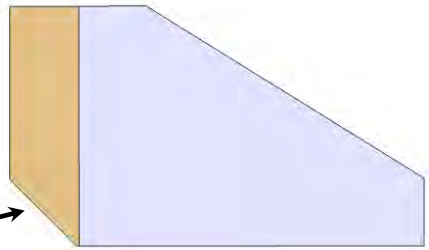
18-Use (8) 4-40 socket cap screws ¾'' long and (1) ½'' long to assemble cowling to fuselage.

COWLING INSTALLATION-1

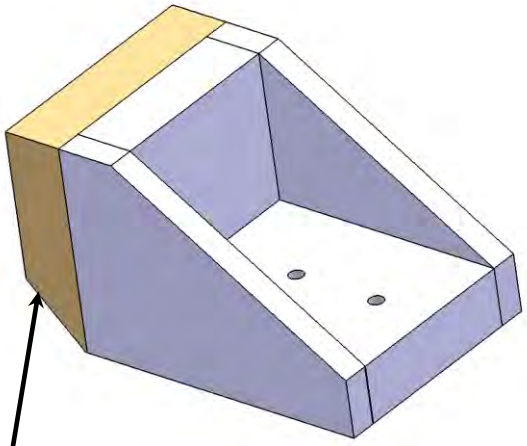
The method shown here is a suggestion.
Assemble (8) cowling support brackets made from scrap ¼ liteply and ¼ balsa or use simple hardwood blocks
1-Glue ¼ liteply support made from scrap plywood as shown for each bracket assembly
2-Glue side plates on each assembly as shown
3-Using scrap ¼ balsa, make 1 piece 1'' X 1'' for each assembly and glue over as shown
4-Sand a 45 degrees angle on each assembly as shown
5-Make countersink maximum depth 3/32 (approx 2.25mm)





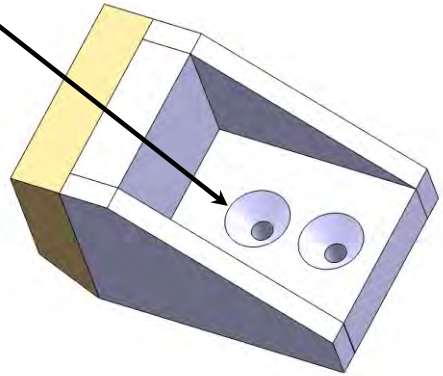


Sand 45 degrees



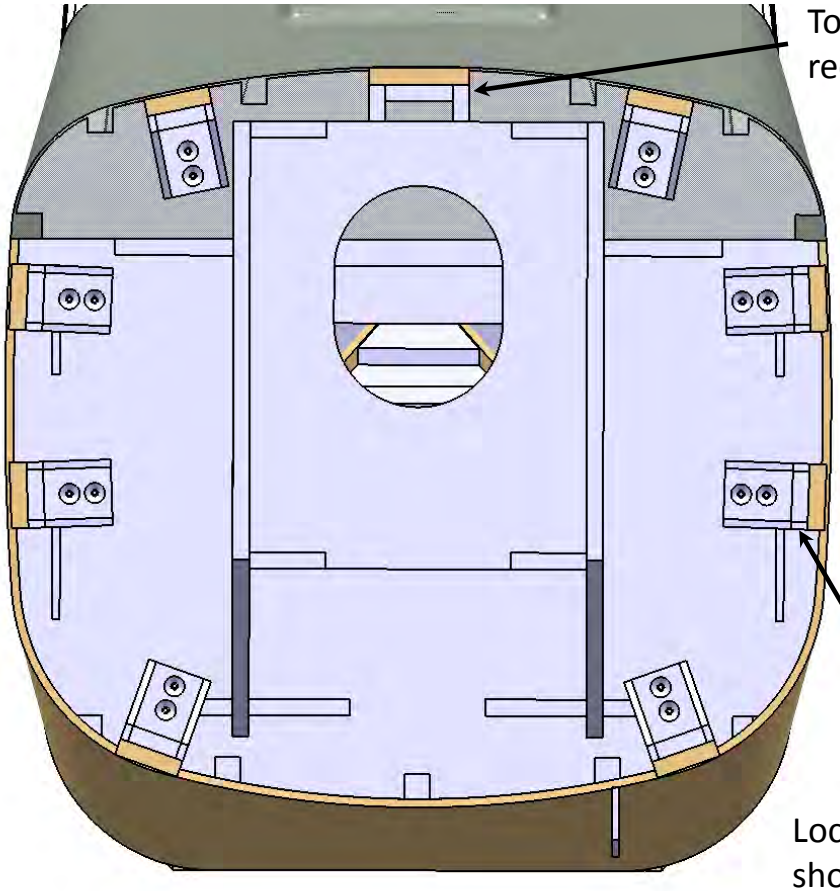
Add ¼ balsa blocks over assembly

Make countersink for #4 countersink head screws



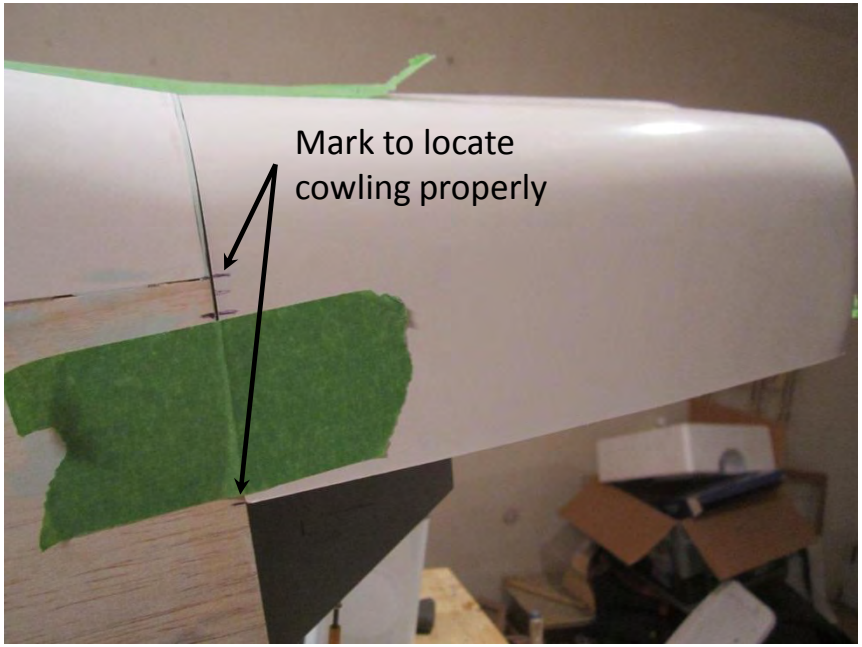
COWLING INSTALLATION-3

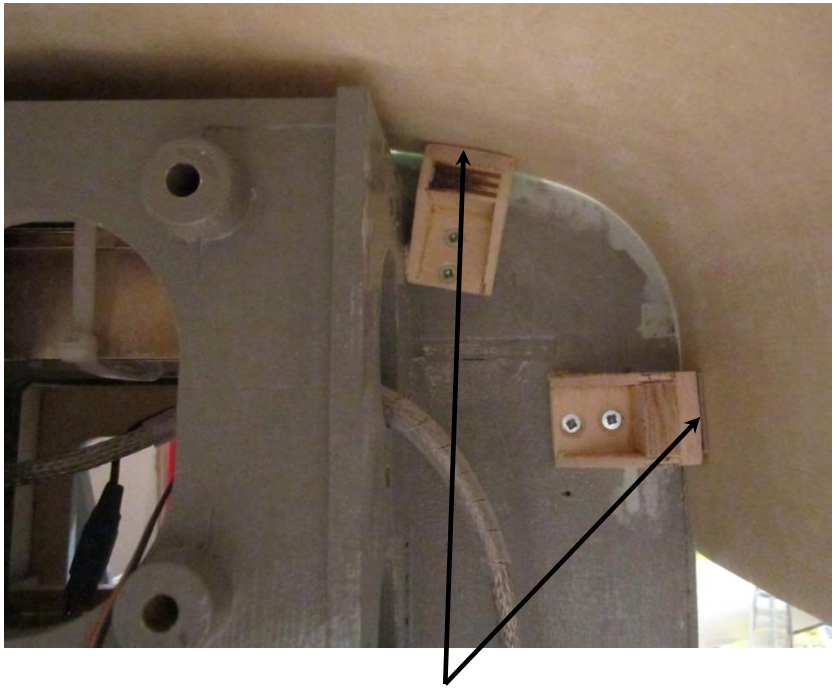
1-Using #4 countersink screw X ¾ long screws, install cowling support blocks on F1 as shown. To make support block, scrap ¼ liteply and ¼ balsa
2-Locate the top center block. It will be glued in place later. For now, use small tack of glue to keep it in place.
3-Light sand the balsa block over each block to have the proper shape. It will need to be adjusted to ensure proper fit between the dashboard and the top cowling part.



COWLING INSTALLATION-4

1-Locate the top cowling part over the brackets and hold in place using masking tape.
2-Measure each side to make sure of proper alignment. Make marks to locate the top cowling.
3- If the fit between the dashboard and the top cowling is not perfect, lightly sand the balsa block until fit is good. Do not sand the 1/8 sheeting around front of fuselage.

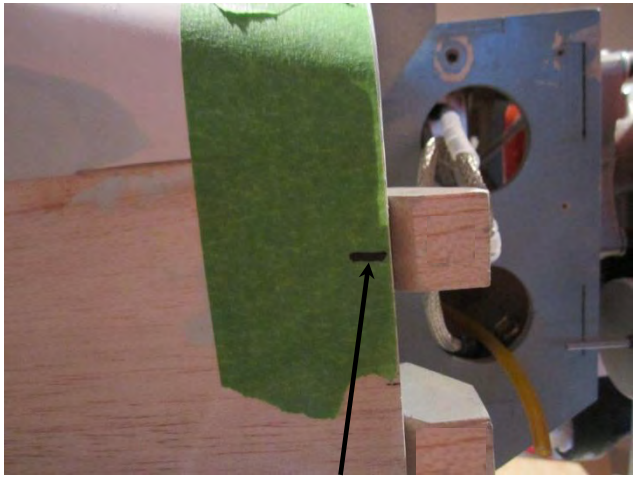




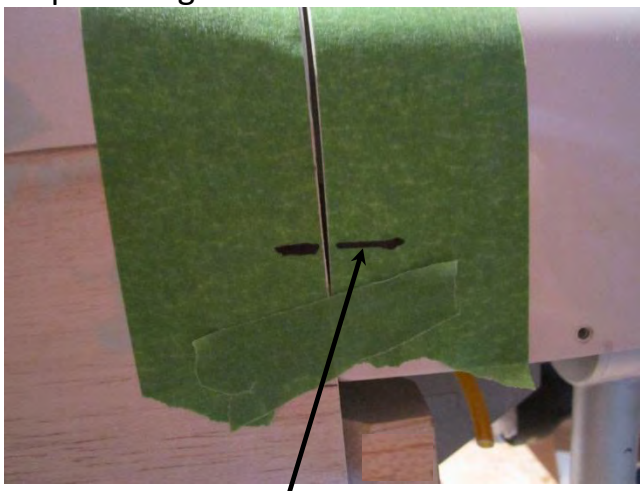
Proper fit after sanding the balsa blocks

COWLING INSTALLATION-5

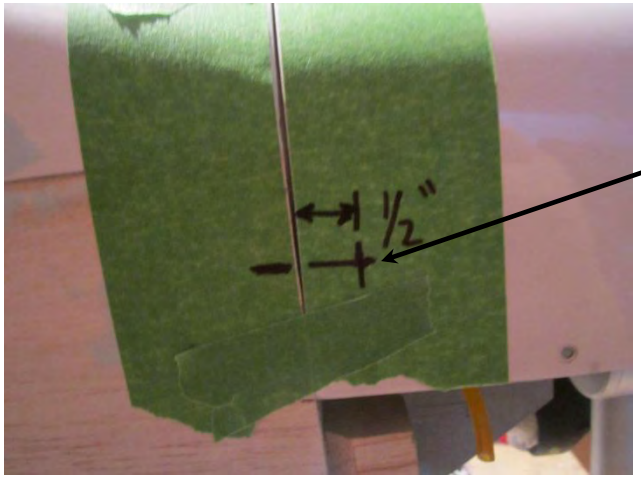
1-Apply masking tape around the front of the dashboard and mark location of the center of each top brackets.
2-Install the top cowling, apply tape on the edge of the cowling and transfer marks from dashboard locations to the cowling. These marks will define hole location.
3-Measure ½'' from F1 face and mark holes center at (5) places on top cowling



Apply tape over dashboard.
Mark location of brackets on tape



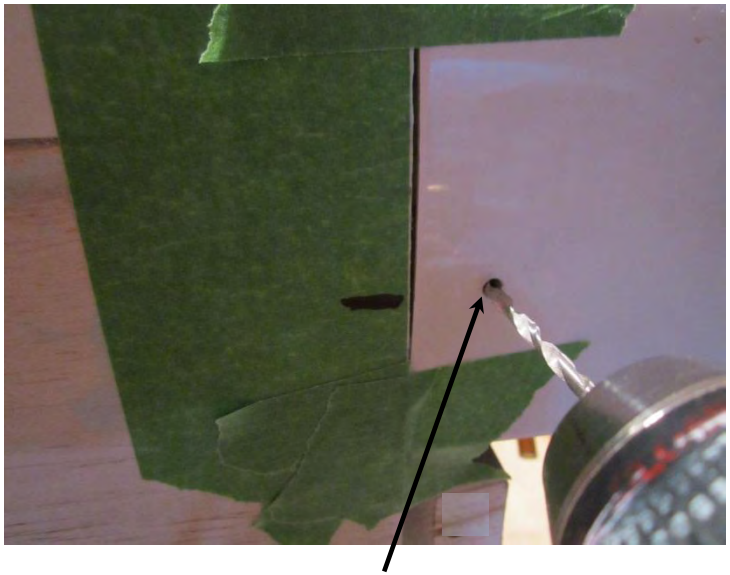
Apply tape on top cowling , install top cowling over brackets
Transfer lines to top cowling



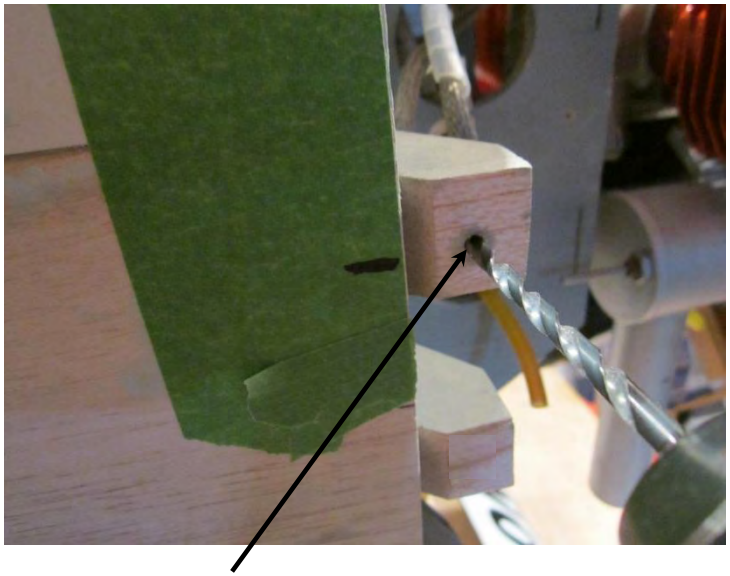
Measure ½'' at each locations

COWLING INSTALLATION-6

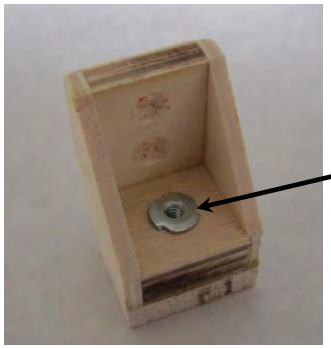
1-Using a 7/64 diameter drill (2.78mm), make 5 holes at marked locations. Drill through both the cowling and the support brackets
2-Using a 5/32 diameter drill (3,97mm), enlarge holes made in support brackets only
3-Install (1) 4-40 T-nut inside each assembly and glue it in place.
4-Untack the top center bracket, install 4-40 T-nut and glue bracket in place with carpenter glue or epoxy.



Drill 7/64 Diameter through cowling and support bracket



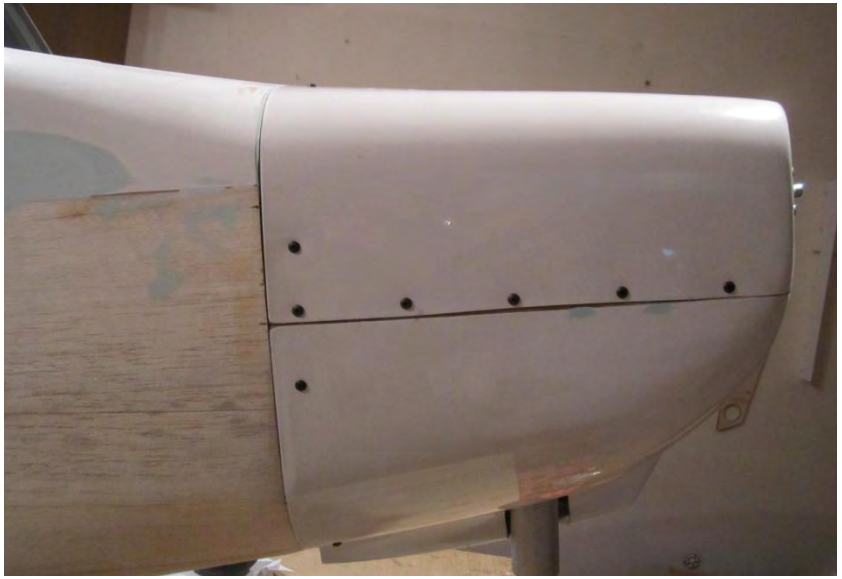
Drill 5/32 Diameter through cowling and support bracket

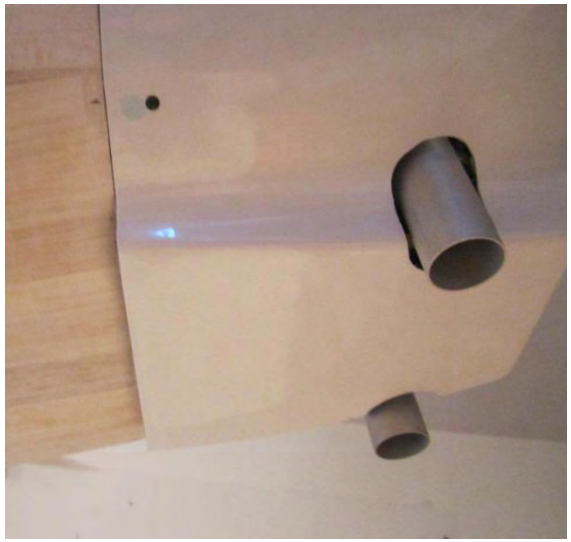


Glue the top center bracket using carpenter glue or laminating epoxy

COWLING INSTALLATION-7

Use (8) 4-40 socket cap screw ¾'' long and (1) ½'' long (top center bolt) to secure the cowling to the fuselage as shown.
If required, sand the fuselage 1/8 balsa sheeting to match the cowling properly.



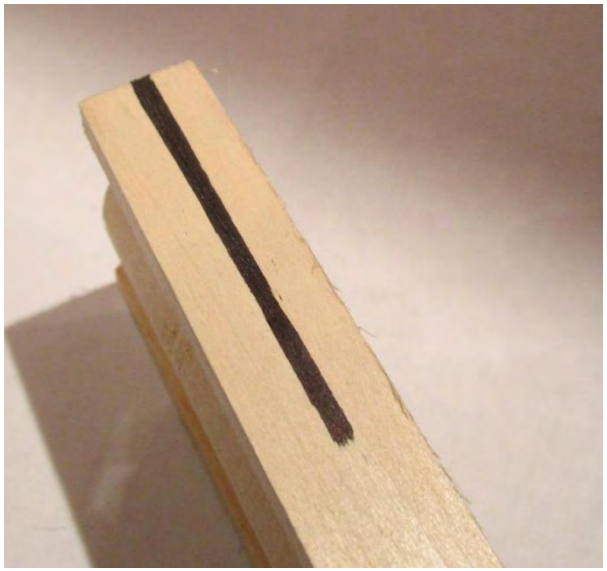


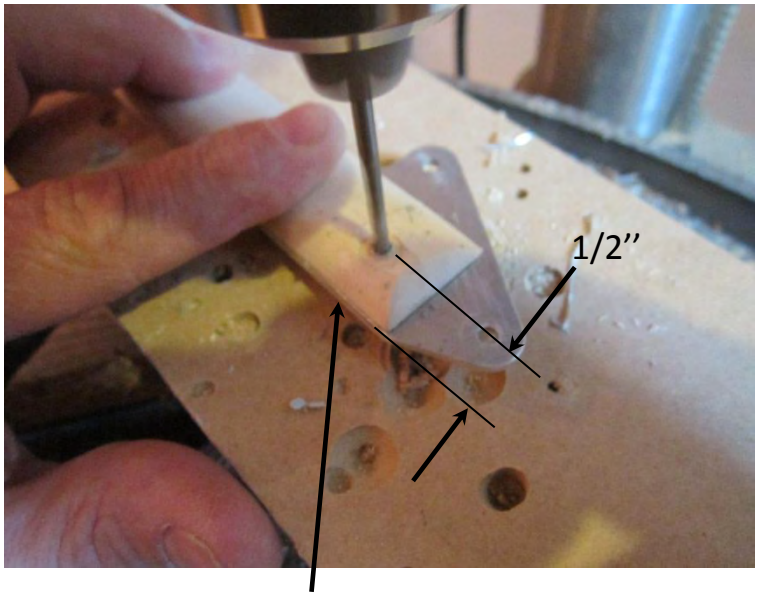
COWLING INSTALLATION-8

1-Install (2) fairing made from scrap 1/8 plywood as shown in picture below
Notice the cutout made on the cowling to increase air exit

STRUTS INSTALLATION-1

You will need to make 2 sets of struts (left and right wing struts assemblies)
Front and rear strut need to be prepared as follow:
1-Using a band saw, cut in FRONT strut a slot 2 inches long at one end 3/32 wide approximatively
2-Using a band saw, cut in REAR strut a slot 1 1/8 inches long at one end 3/32 wide approximatively
3-using band saw, remove excess material at L.E. and T.E. of each strut (front and rear)
4-Round leading and trailing edge using coarse sand paper
5-Install large strut bracket on the slot with front edge flush with leading edge of FRONT strut.
6-Drill 2 holes 1/8 diameter located ½ inch from leading edge

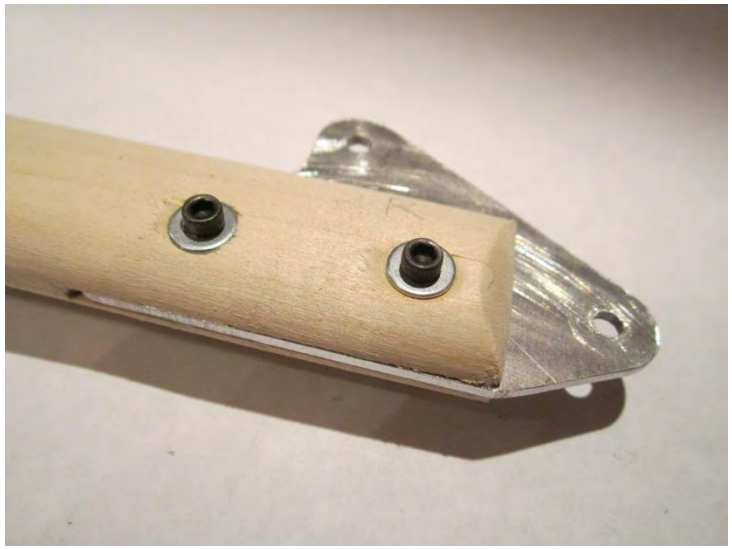


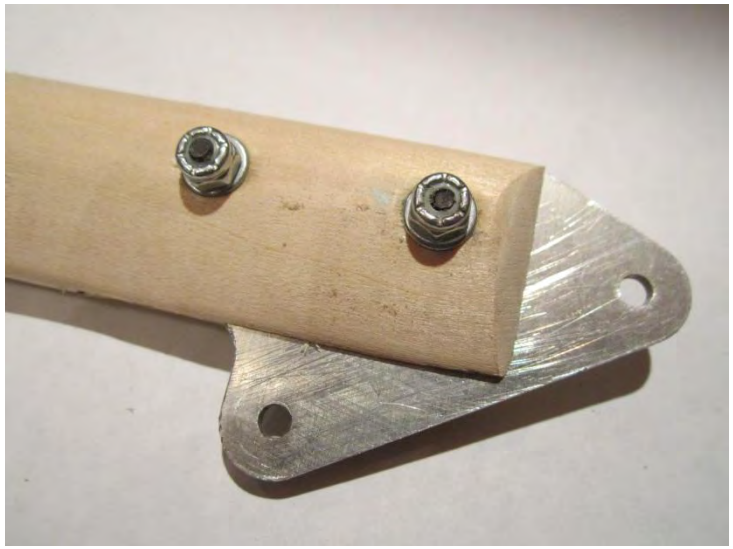


STRUTS INSTALLATION-2

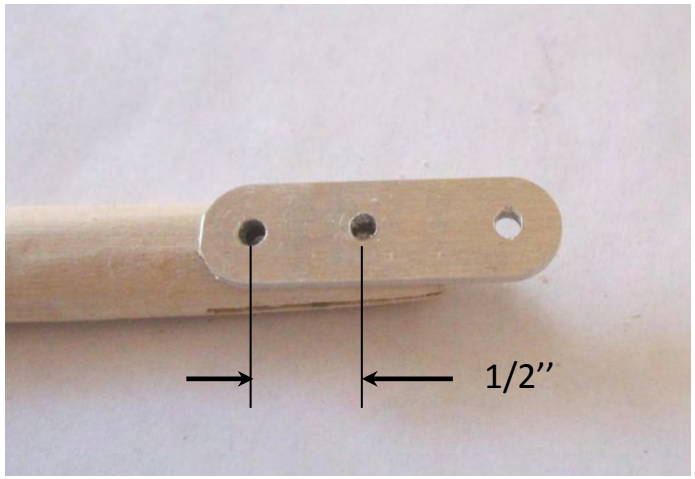
1-Using 4-40 x ¾ long SHCS, secure large bracket to FRONT strut.

4-40 X 3/4 SHCS	(2)
4-40 locknut	(2)
#4 washer	(4)





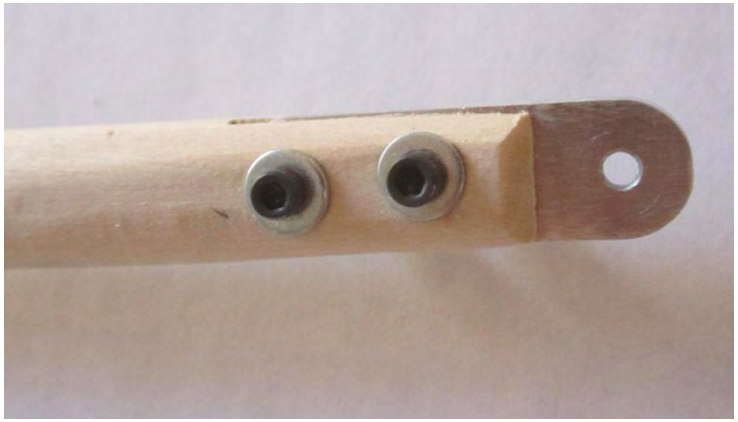
2-Mark location of holes in the REAR strut using the small aluminium bracket as hole location jig. Bracket should be flush with leading edge of REAR strut. Make sure to use holes that are at ½'' of each other
3-Drill 2 holes 1/8 dia



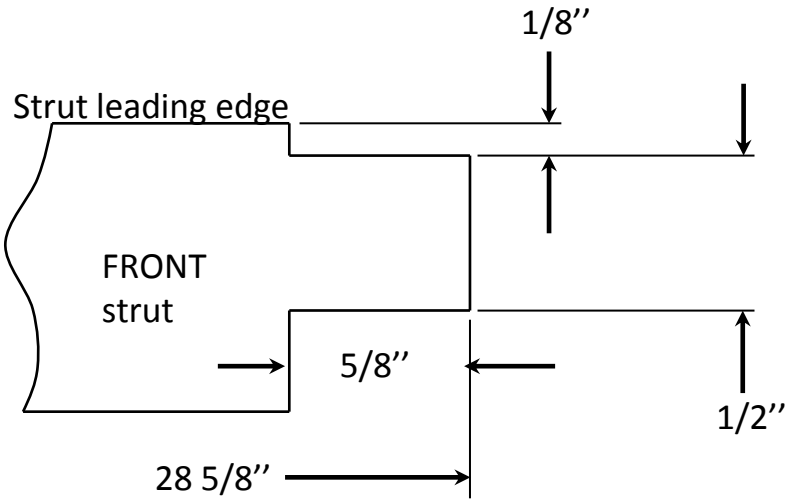
STRUTS INSTALLATION-2a

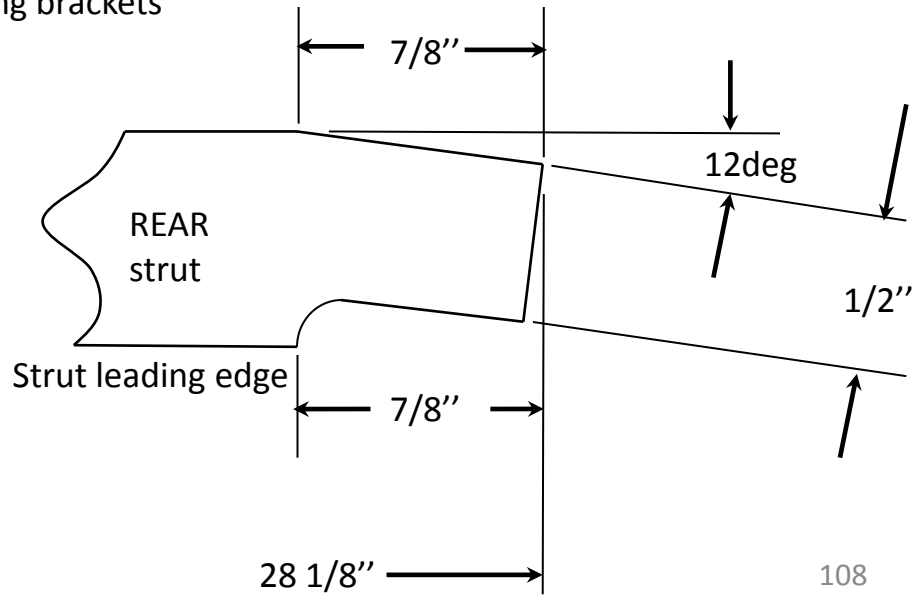
1-Using 4-40 x 5/8 long SHCS, secure large bracket to REAR strut.

4-40 X 5/8 SHCS	(2)
4-40 locknut	(2)
#4 washer	(4)



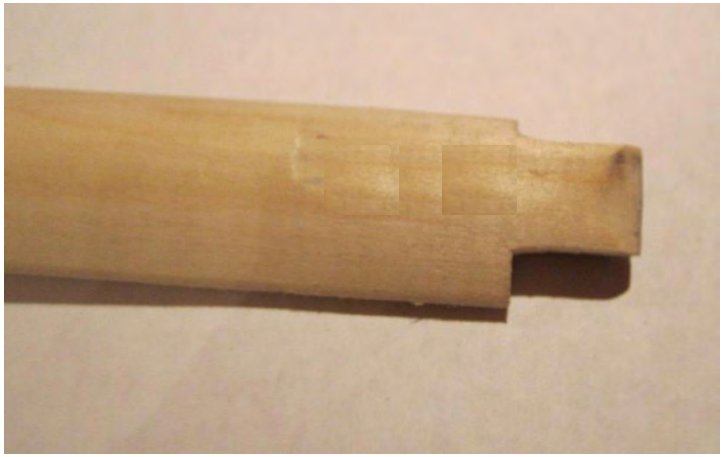
2-Trim FRONT strut at a length of 28 5/8''
3-Trim REAR strut at a length of 28 1/8''
4-Cut end of FRONT strut as shown to fit between front wing brackets
5-Cut end of REAR strut as shown to fit between rear wing brackets





STRUTS INSTALLATION-2b

Front strut end shape
Round end of strut as shown

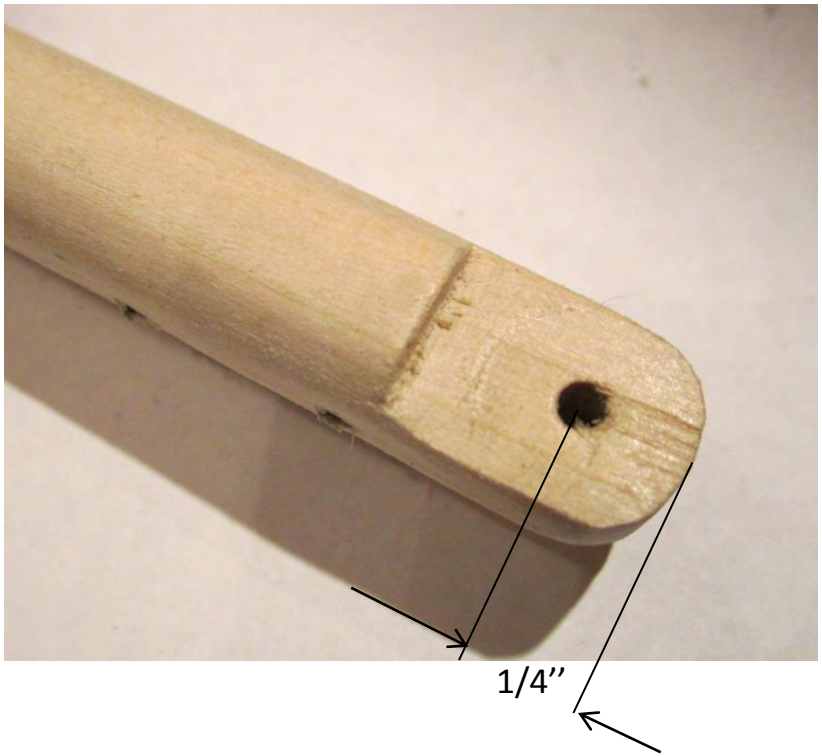


Rear strut end shape
Round end of strut as shown

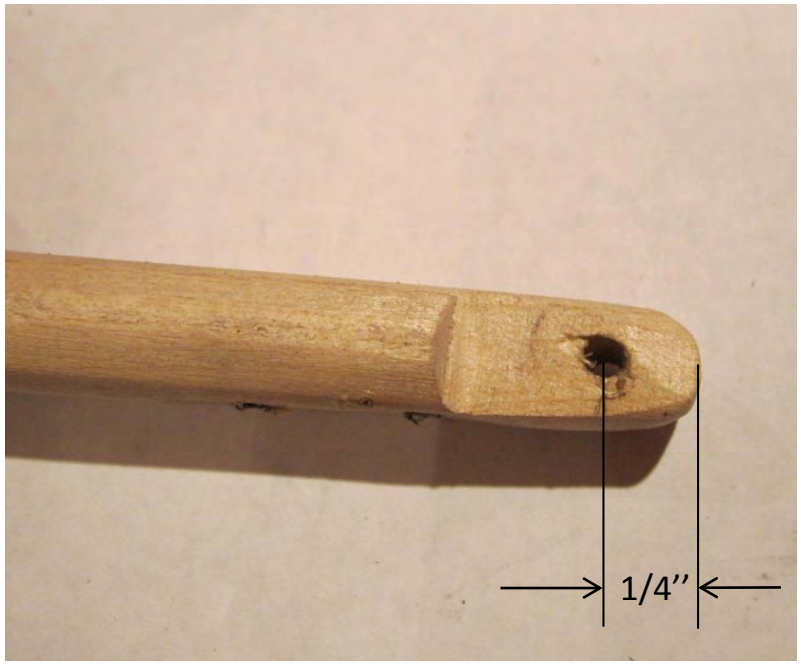
STRUTS INSTALLATION-3

1-Drill 1/8 dia hole in the end of the FRONT strut as shown
2-Drill 1/8 dia hole in the center of REAR strut as shown

FRONT strut

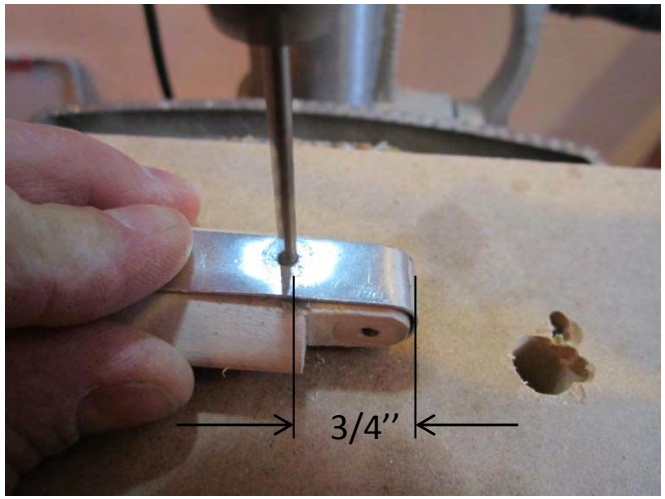


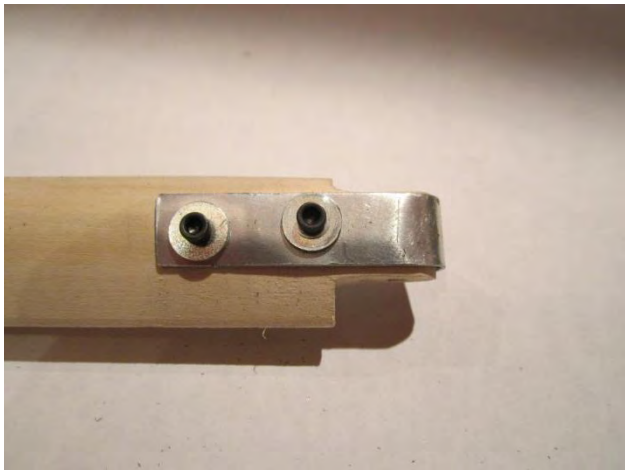
REAR strut end



STRUTS INSTALLATION-4

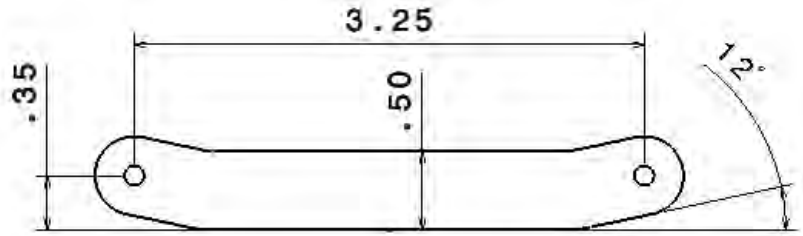
1-Using .020 aluminium sheet, cut (1) strap 4 ¼ inches long and ½ inch wide. Round each end
2-Wrap the strap over the end of the FRONT strut
3-Drill 2 holes through the strap and the FRONT strut. First hole at ¾'' from end second hole at ½'' from first hole
4-Use 4-40 SHCS 1'' long to secure strap to strut end. Repeat step for the other wing strut.





STRUTS INSTALLATION-5

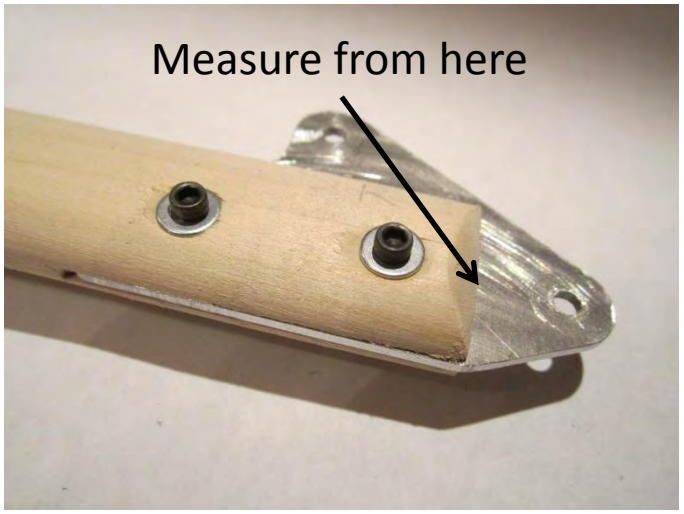
1-Using .020 aluminium sheet, cut (1) strap using the template provided below. Use the tmplate provided to make the bracket.
2-Wrap the strap over the end of the REAR strut
3-Drill 2 holes through the strap and the REAR strut. First hole at ¾'' from end second hole at ½'' from first hole
4-Use 4-40 SHCS ¾'' long to secure strap to strut end. Repeat step for the other wing strut.

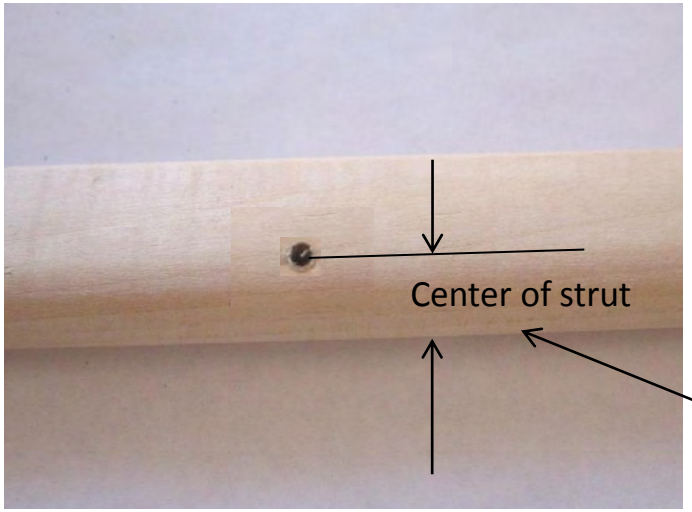


REAR STRUT BRACKET
MADE FROM .020 ALUMINIUM

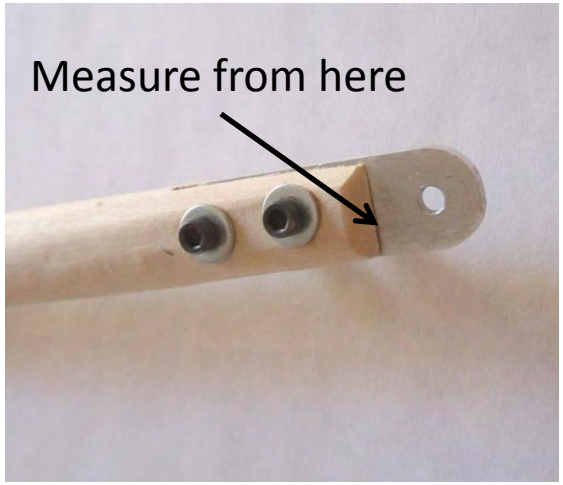
STRUTS INSTALLATION-6

1-Drill 1/8 dia hole at 16 ½'' from the end near the fuselage on the FRONT strut as shown in picture. Interstruts must be perpendicular to wing bottom so the hole must be made to suit this requirement



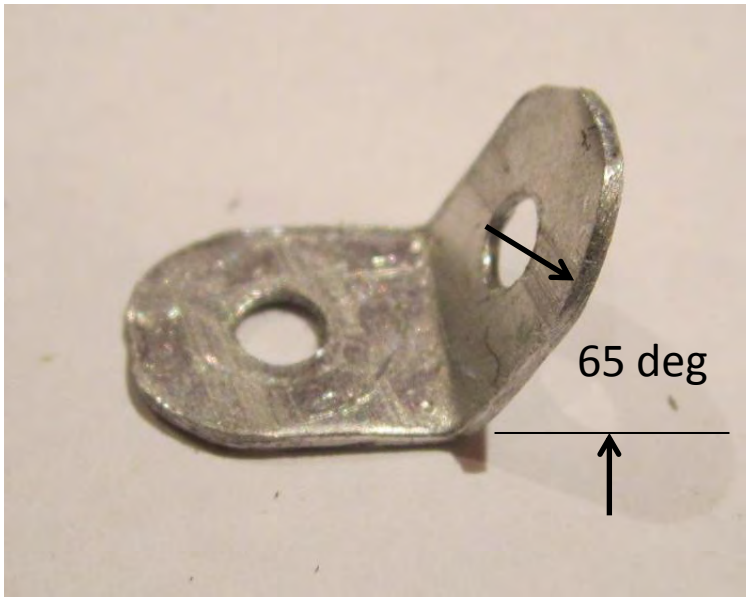


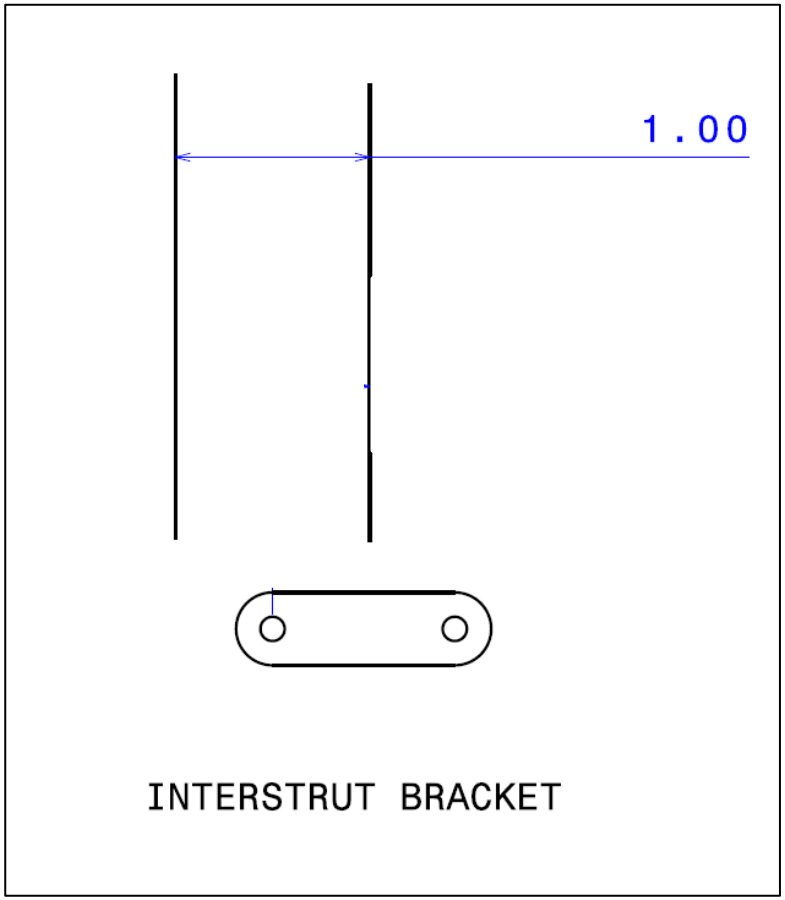
2-Drill 1/8 dia at 15 5/8½'' from the end near the fuselage on the REAR strut as shown in picture. Interstruts must be perpendicular to wing bottom so the hole must be made to suit this requirement



STRUTS INSTALLATION-7

1-Make (2) interstrut brackets from .020 aluminium as per sketch shown below for each wings
2-Bend each bracket 65 degrees up in the center of bracket

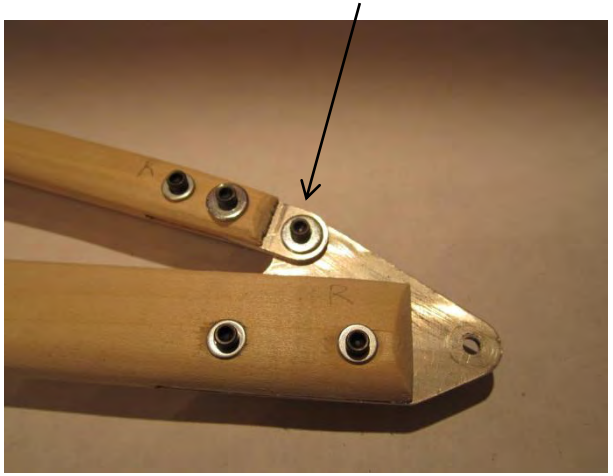


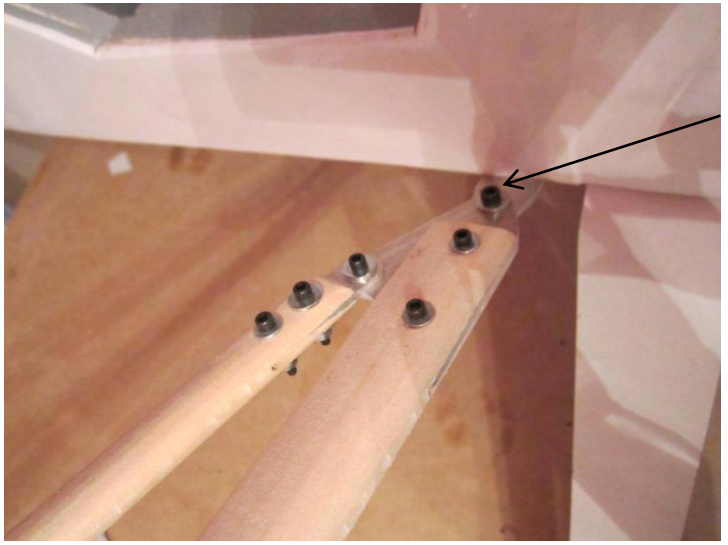


STRUTS INSTALLATION-8

1-Install both wings on fuselage using the 1 ¼'' dia aluminium tube and (2) ¼-20 nylon bolts
2-Assemble rear strut to front strut using (1) 4-40 SHCS 3/8'' long with (1) 4-40 locknut and (3) #4 washers
3-Install strut assembly to the airframe using 6-32 SHCS ½'' long with (1) 6-32 locknut and (2) #6 washers on each sides
4-Attach end of struts to the wing using (2) 4-40 SHCS 1'' long with (2) 4-40 locknuts and (4) #4 washers

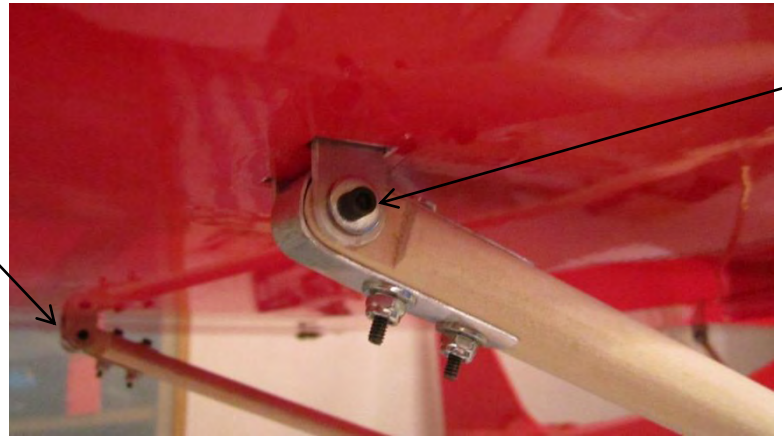
4-40 SHCS 3/8'' long





6-32 SHCS ½'' long

4-40 SHCS 1'' long



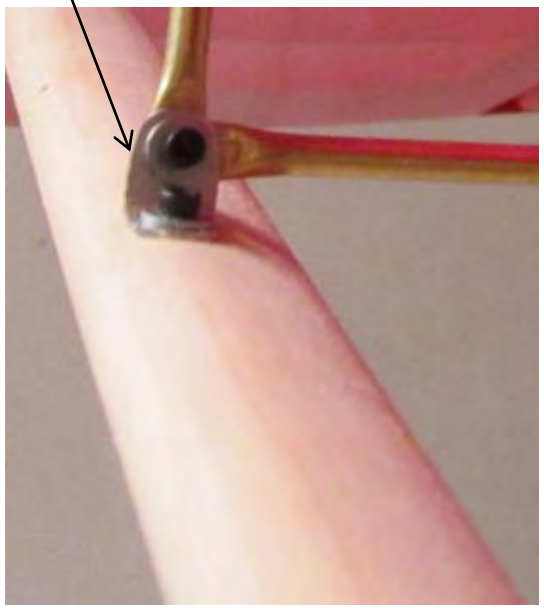
4-40 SHCS 1'' long

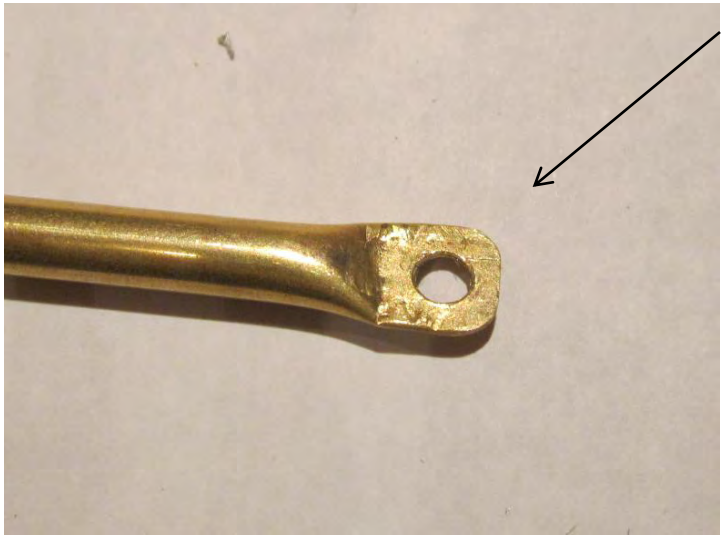
STRUTS INSTALLATION-9

1-Install interstrut bracket on front and rear struts as shown
2-Using 3/16'' dia tube make (2) of each interstrut tubes as per the following dimensions:
NOTE: prior drilling tube ends, use a hammer or a vise to make ends flat
3-Use (1) 4-40 SHCS 1'' long to secure front interstrut bracket to front strut
4-Use (1) 4-40 SHCS ¾'' long to secure rear interstrut bracket to rear strut

FRONT INTERSTRUT: cut tube to 4 5/8'' long, holes spacing of 4 3/16''
REAR INTERSTRUT: cut tube to 5 11/16'' long, holes spacing of 5 3/8''
INTER TUBE: cut tube to 6 1/8'' long, holes spacing of 5 11/16''
Drill all holes using 1/8 dia drill

Interstrut bracket on front and rear struts

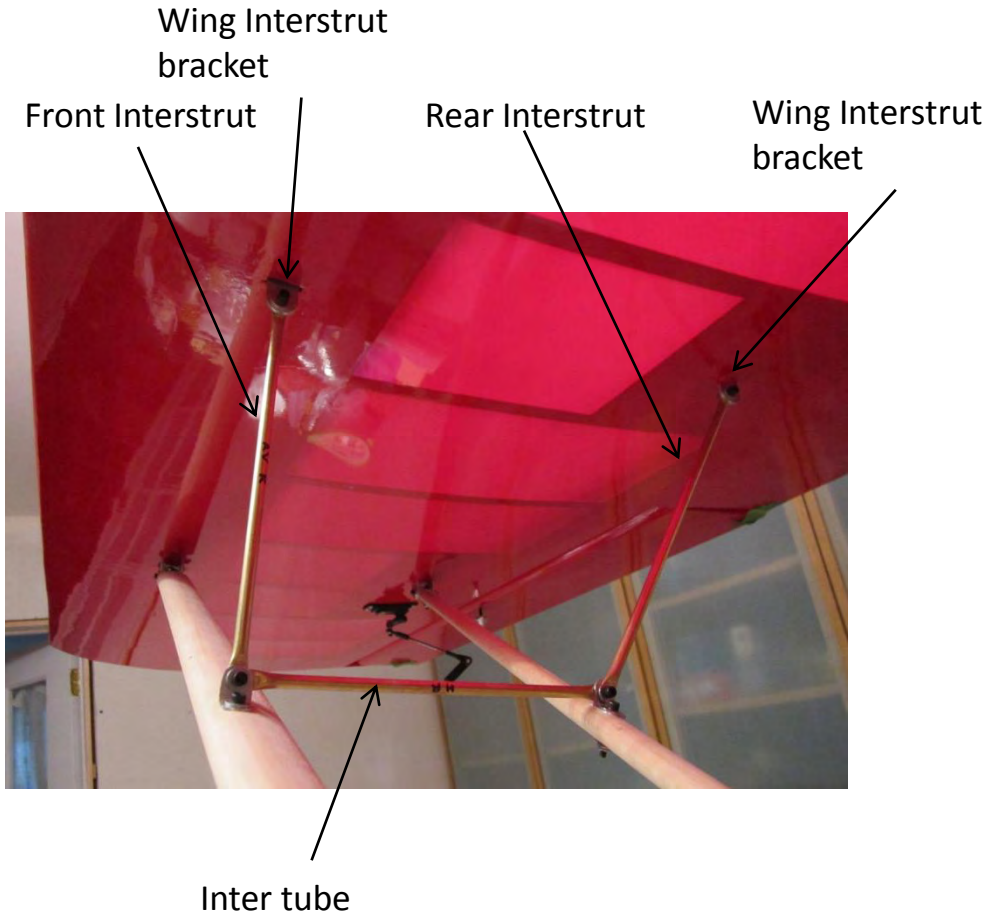




Flat at each ends 3/8 long

STRUTS INSTALLATION-10a

1-Install interstrut tubes as shown. Use (4) 4-40 SHCS 3/8'' long with (4) 4-40 locknuts and (8) #4 washers on each wings

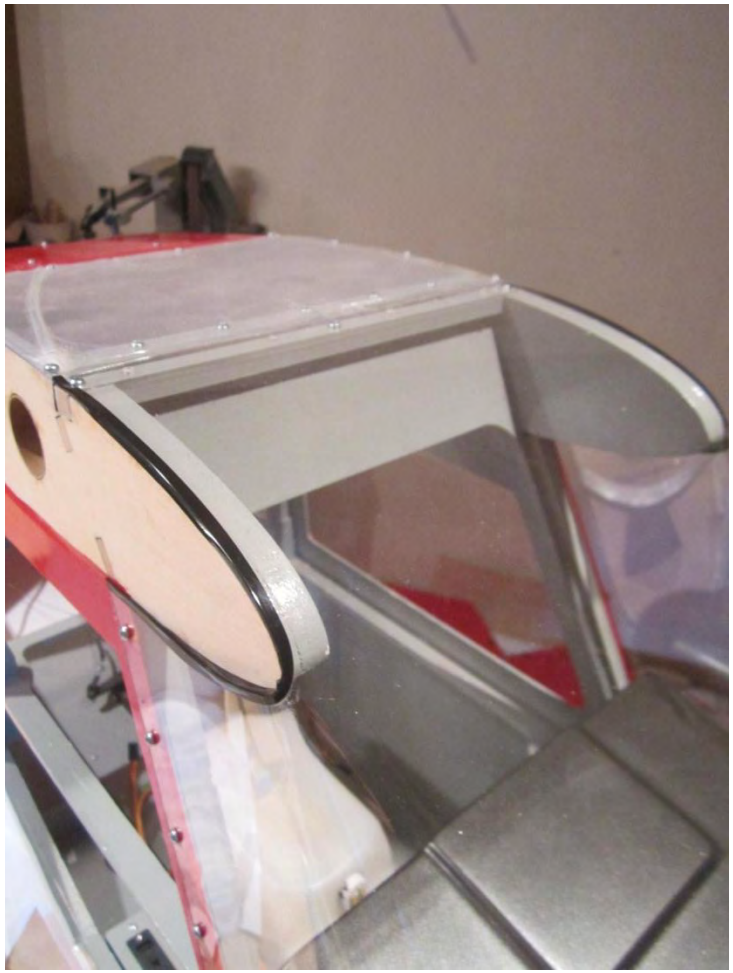


STRUTS INSTALLATION-10b

Front view of interstruts installation

WINDSHIELD INSTALLATION-1

1-Prior gluing the front windshield, dry fit over the fuselage. Use tape to hold in place
2-Secure the top of window using (5) #4X ½ screws on the hardwood stick located in front of F2B. Make sure it align perfectly with F14 outer wall

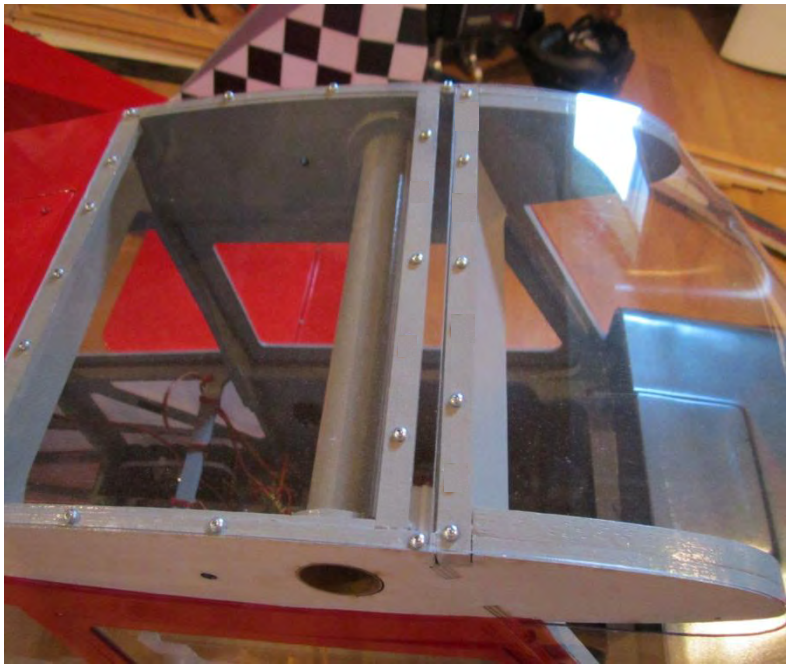


WINDSHIELD INSTALLATION-2

1-you can apply light heat using an hair dryer to pre-form the windshield. **Do not apply too much heat since it may distort the windshield.**
2-Once fit is good, start gluing the front center portion using Pacer Formula560 canopy glue or equivalent glue. Apply tape to hold in place.
3- Once the center area is dry, apply glue to both lower side of the windshield and install #4X ½ screws (5 on each side as shown in picture)

WINDSHIELD INSTALLATION-3

1-Once the windshield is secure, use ½ automotive trim tape to finish the contour of the windshield
2-Install top rear window using (14) #4 X ½ screws as shown in picture



WINDSHIELD INSTALLATION-4

1-there are (2) front side windows. One of them is a bit smaller. This is the one that is going in the door aperture. The other one is installed in the fuselage left side.
2-Glue both front window in their proper location using Formula560 glue or equivalent.
3- Glue both rear window on each sides of the fuselage.

Door windows is a bit smaller

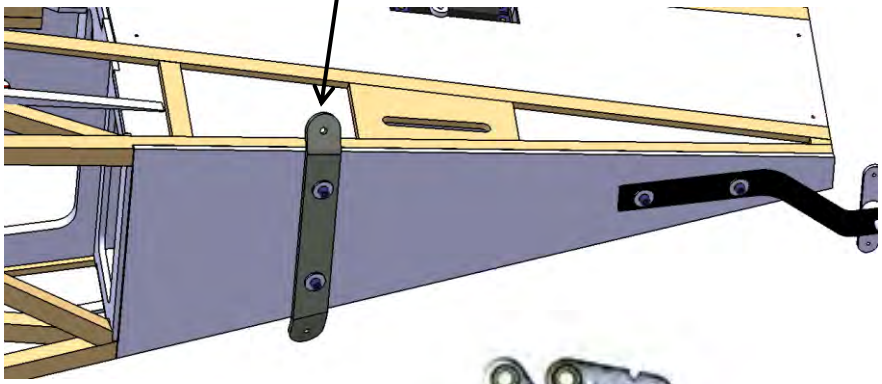
fuselage windows

rear windows on both side

FLYING WIRES INSTALLATION-1

1-there are (8) flying wire brackets (sullivan tabs) and one larger braket that is located under the rear end of the fuselage.

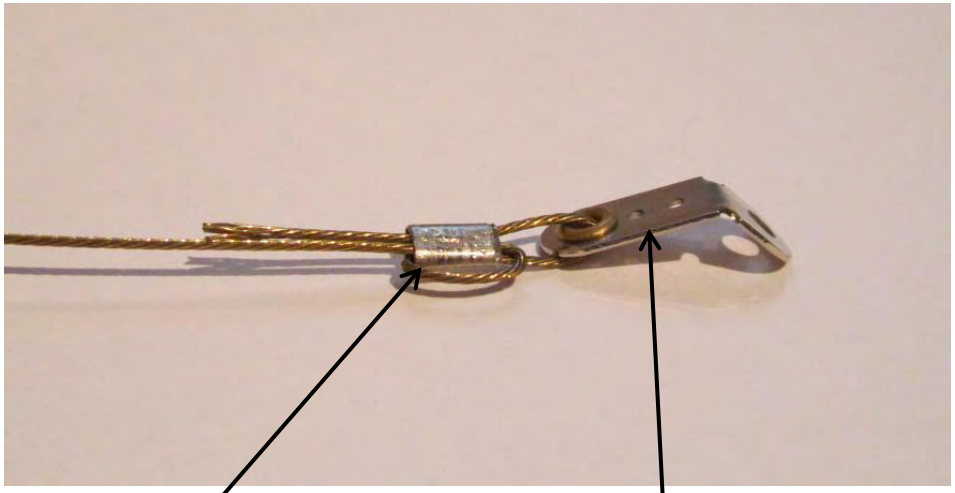
rear flying wire bracket

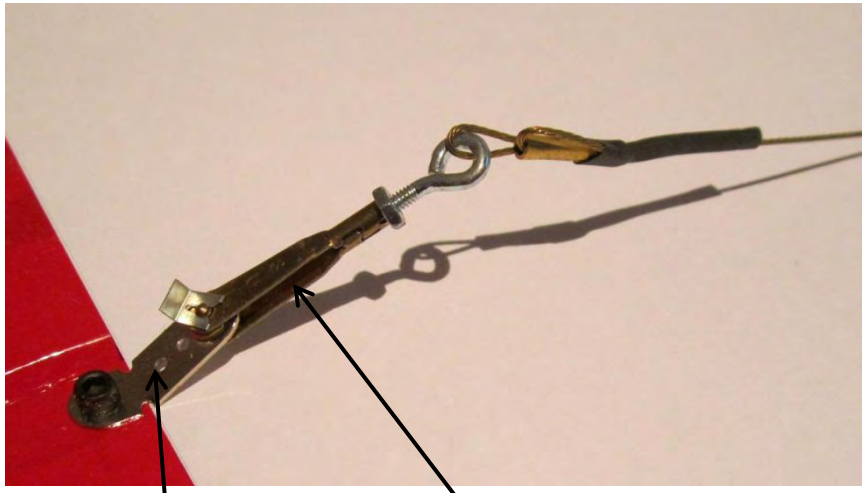


Sullivan tabs used as flying wire brackets

FLYING WIRES INSTALLATION-2

1-Install both stabs on the plane
2-Measure distance from tip of stab to tip of rudder fin. This measure should be equal on both sides. Maintain perpendicularity between surfaces using tape.
3-Bend sullivan tabs as shown in order to have straight line between both ends of wire.
4-Use (3) 4-40 X ¾ SHCS and install tabs on both sides of each stabs and rudder fin with (3) 4-40 locknuts
Use (2) 4-40 X 3/8 SHCS to fix tabs to fuselage bracket with (2) 4-40 locknuts
5-Use steel cable from Sullivan product to make flying wires as shown below. One end must be adjustable.



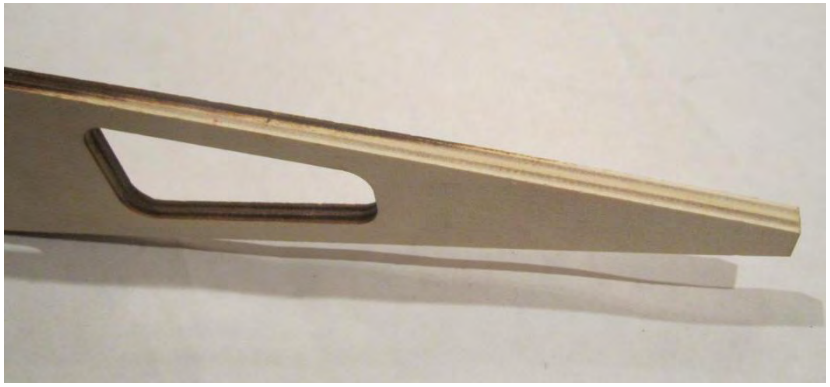


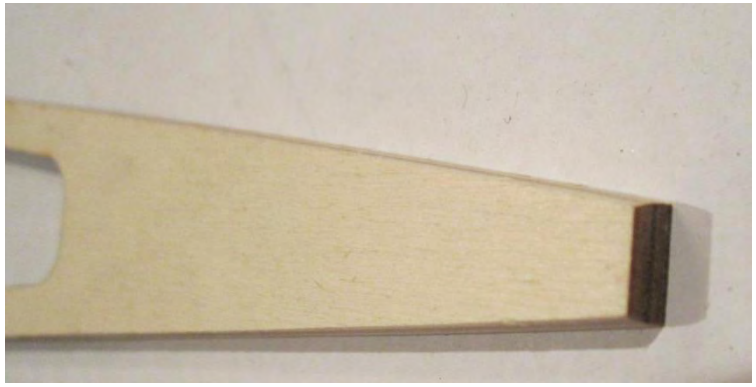
FLYING WIRES INSTALLATION-3

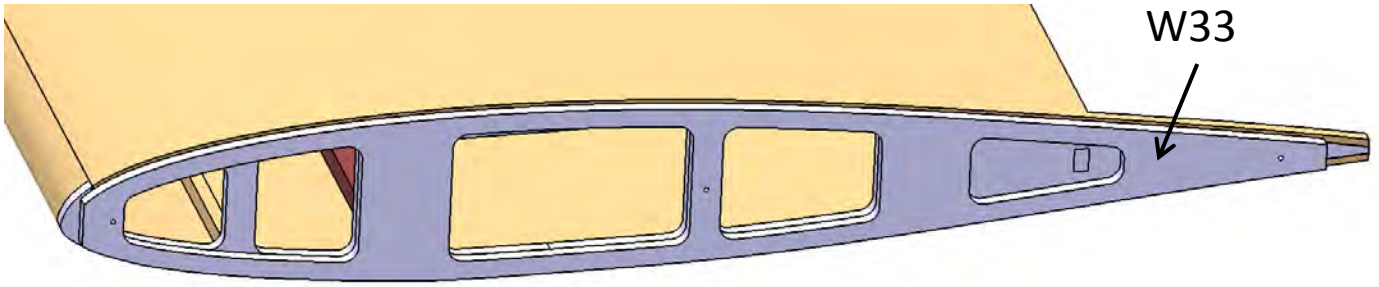
Pictures below indicates the way that flying wires are installed. Do not adjust them so that they are too tight. They should be straight but not too tight.

WING TIP INSTALLATION-1

1-Paint the wing tip first. Wing tip will be glued over wing tip support
2-Prior gluing anything, dry fit the W33 rib inside each wing tip. It is required to sand the trailing edge taper to fit the wing tip







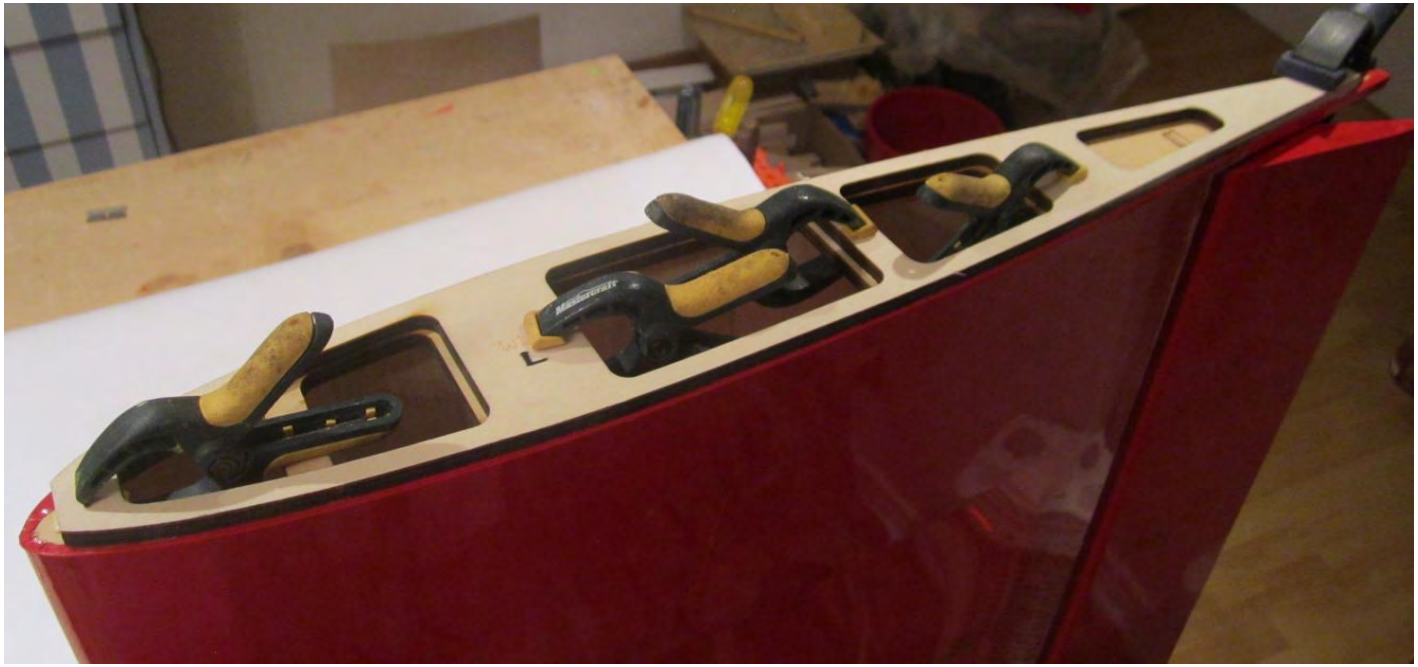
Carefully locate W33 over W13. Use wing tip to align W33

WING TIP INSTALLATION-2

4-Now, slide the fiberglass wing tip over W33 and check fit between wing tip and wing profile. You may have to add shim to W33 or to sand either the wing tip inner area or W33 outer profile a little bit so that wing tip fit perfectly. To sand W33, it is better to remove it from wing assembly

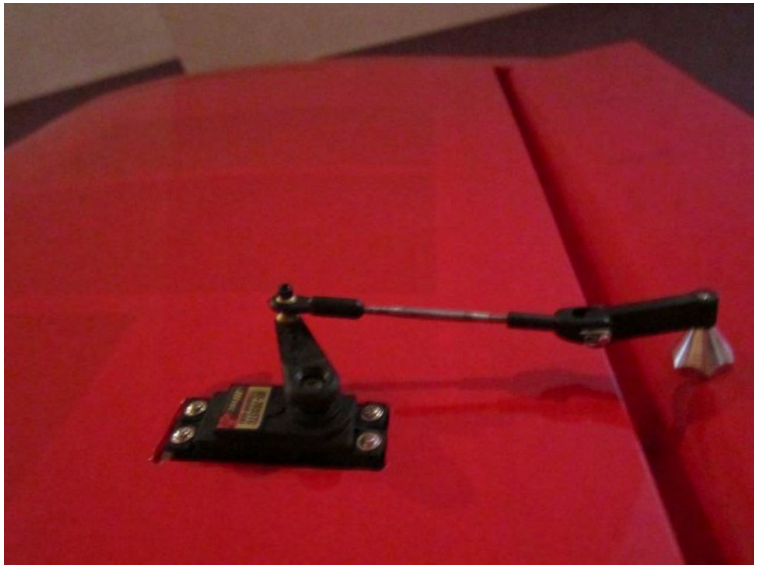
WING TIP INSTALLATION-3

5-When the wing tip match the wing profile properly, apply glue to W33 and glue it in place.
6-Last step is to glue the wing tip or use small screws all around if you want it removable. (screws not provided in kit)



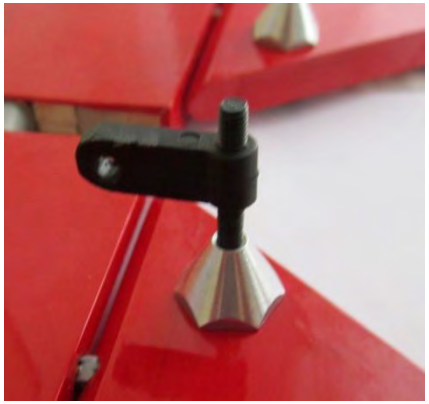
SERVOS INSTALLATION-1

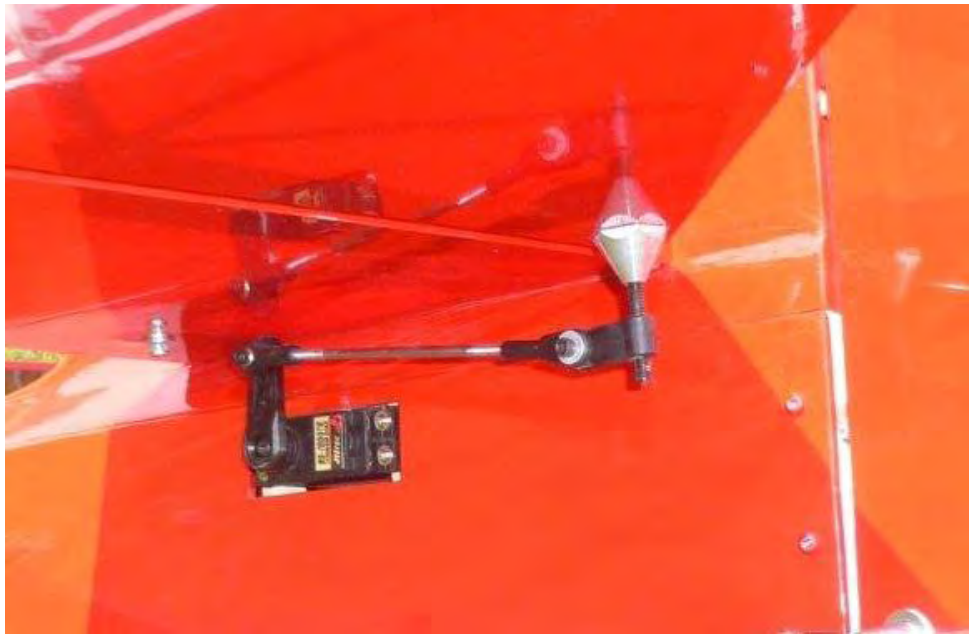
1-Aileron: Notice: SHCS bolts required to connect to servos are not includes in kit
A-Drill and tap 1 hole for 8-32 screw in hardwood aileron block (approximatively ¾ inch deep)
B-Install horn and locknut on 8-32 screw. Screw them until they reach the head of the screw
C-Apply glue in hole and install 8-32. (approximatively ¾ inch deep)
D-Make the required linkage as shown on pictures.
D-Once the glue is set, trim the head of the screw to proper length.



SERVOS INSTALLATION-2

1-Elevator: Notice: SHCS bolts required to connect to servos are not includes in kit
A-Use 2 inches 8-32 SHCS and plastic washer and install it in 3/16 dia hole found in the elevator
B-Install lock nut and horn on the other side to proper position
C-Make the required linkage as shown on pictures.
Notice that the horn may need to be trimmed and redrilled so the pivot point is inline with elevator leading edge





SERVOS INSTALLATION-3

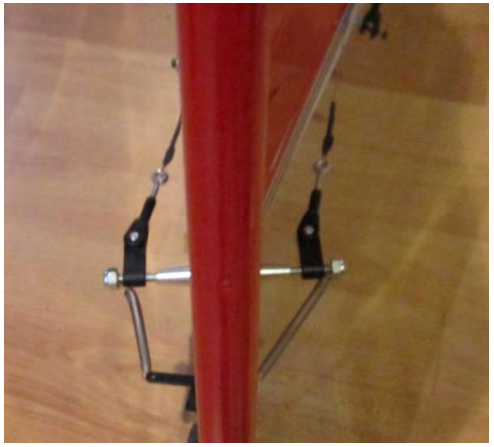
1-Rudder: Notice: Pull-Pull cable is not included in kit. SHCS bolts required to connect to servos are not includes in kit

A-Use (1) 3 inches 8-32 threaded rod and (2) locknuts and install it in 3/16 dia hole found in the rudder

B-Install (2) horns on the each sides to proper position

C-Make the required pull-pull cables as shown on pictures.

Notice that the horn may need to be trimmed and redrilled so the pivot point is inline with rudder leading edge

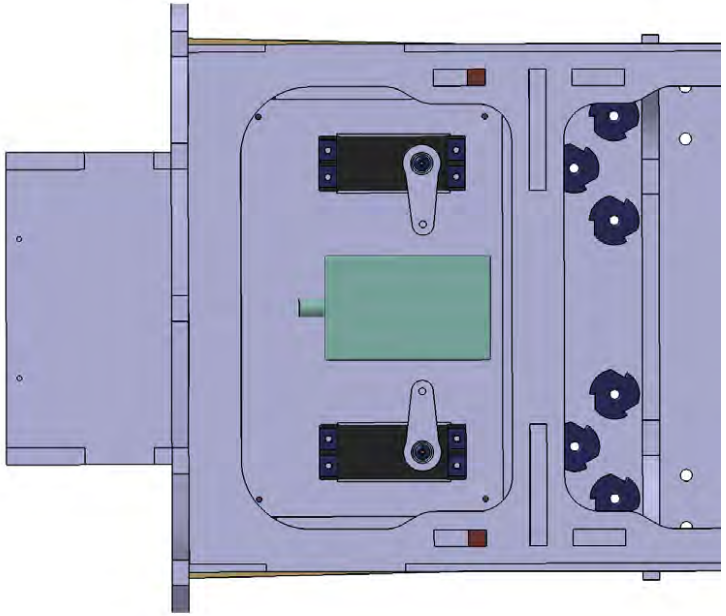


SERVOS INSTALLATION-4

1-Engine: Notice: SHCS bolts required to connect to servos are not includes in kit
Throttle and choke servos can be installed inside the fuselage but there will be no easy access in case of problem with these servos once the plane is completed.

Depending on the engine used, servos installation may differ significantly.

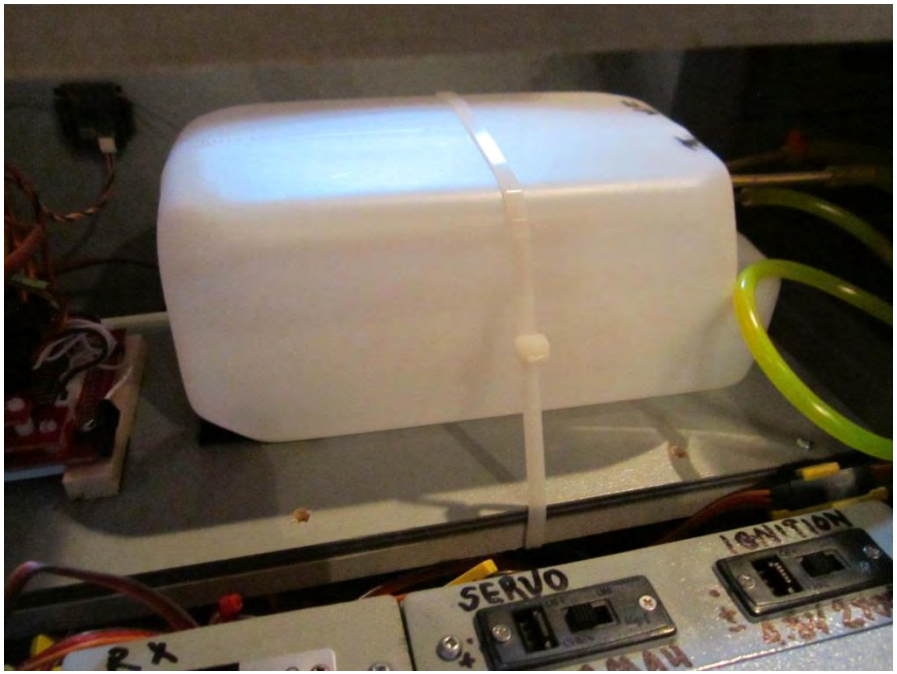
inside the fuselage installation that can be used on engine with rear carburetor

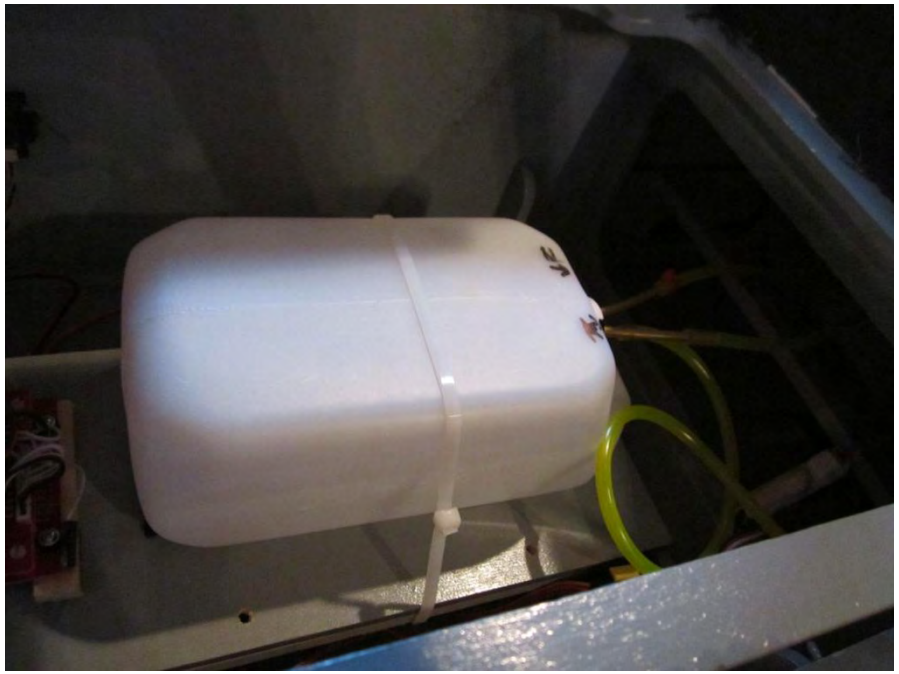


Example of installation for a twin 50cc engine with carburetor under engine

TANK INSTALLATION

Tank should be installed on the plate and approximatively centered on the CG
We usually suggest to use velcro under the tank and a tie wrap to secure it to mounting plate.





CG AND CONTROL THROW

CG: LOCATED IN THE CENTER OF THE WING TUBE

Control throw:

	high rate	low rate
Aileron :	1 inch	60%
Elevator :	1 inch	60%
Rudder :	1 1/4 inch	60%

Use of exponential is also a good thing to consider depending on your flying style.

Final weight of the plane is 20-22 pounds depending on equipment/engine used.

Use standard servos suitable for 50CC engine aircraft

Recommended engines: DLE30 up to DLE55, DA50, MOKI 45, NGH GT35, PTERODACTYL 36, RCGF32 to 45 single or 40 or 50 TWIN, ROTO35, ZDZ40 to 50 all available from AMR-RC.

It is strongly recommended to stay within this range. Failure to do this may damage the airplane since it is not design for larger engines.